

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Audio-magnetotelluric and telluric data release
for the Ten-Lakes Wilderness study area, Montana

by

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Open-File Report 83- 622

This report is preliminary and has not been reviewed for conformity with U.S.
Geological Survey editorial standards and stratigraphic nomenclature.

1983

INTRODUCTION

The purpose of this report is to release audio-magnetotelluric (AMT) and telluric traverse (TT) data for the Ten-Lakes Wilderness Study area, Montana. Interpretation of the data will be presented in formal reports to be released later as part of the Geological Surveys Wilderness Studies Program.

LOCATIONS

The Ten-Lakes Wilderness Study area is located in the northwestern part of Montana east of the town of Eureka (fig. 1) with a northern boundary on the Canadian border. Forty-one AMT stations were established within the adjacent to the study area. The location of each sounding is shown in figure 1.

Two telluric traverses made were on the western border of the study area (fig. 1) oriented in a northeast-southwest direction. Traverse 1 passes AMT station 29, (fig. 1) with details of dipole locations shown in figure 2. Traverse 2 passes by AMT stations 23, 24, and 20, (fig. 1) with details of dipole locations shown in figure 3.

DATA

The AMT data were obtained using equipment designed and built by the U.S. Geological Survey. Details of the equipment and the method may be found in Hoover and Long (1976), Hoover and others (1978) and Strangway and others (1973). Sounding data are given in appendix 1. At each site two scalar soundings are obtained, one for a north-south orientation of the telluric dipole, (Pns) and the other for an east-west orientation (Pew). 25 meter dipoles were used in the survey.

The telluric traverse data were obtained using equipment designed and built by the U.S. Geological Survey. Details of the equipment have not been published. The telluric traverse method has been described by Beyer (1977) and by Combs and Wilt (1975). Data for traverse 1 are shown in figure 4 and for traverse 2 in figure 5. Each figure shows the relative variation of the telluric voltage (the earths natural electric potential) observed on each dipole referenced to the first dipole and topography along the profile. Low values of relative telluric voltage indicate area of lower resistivity (Beyer 1977). In this survey four frequencies, 4.5, 7.5, 16.7, and 25Hz, were used.

References

- Beyer, J. H., 1977, Telluric and D. C., resistivity techniques applied to the geophysical investigation of Basin and Range geothermal systems: Univ. of Calif. Lawrence Berkeley Lab. report LB2-6325.
- Bostick, F. X., Jr., 1977, A simple almost exact method of MT analysis: in. proc. Workshop on Electrical Methods in Geothermal Explorations, Univ. of Utah Contact 14-08-0001-G-359.
- Combs, Jim, and Wilt, Michael, 1975, Telluric mapping, telluric profiling and self-potential surveys of the Dunes geothermal anomaly, Imperial Valley, California: 2nd United Nations Symposium on Development and Use of Geothermal Resources Proceedings, p. 917-928.
- Hoover, D. B., and Long, C. L., 1976, Audio-magnetotelluric methods in reconnaissance geothermal explorations: Proc. 2nd W. N. Sympos. Devel. Geothermal Resources p. 1059-1064.
- Hoover, D. B., Long, C. L., and Senterfit, R. M., 1978, Some results from audio-magnetotelluric investigations in geothermal areas: Geophysics v. 43, p. 1501-1514.
- Strangway, D. W., Swift, C. M., and Kalmer, R. C., 1973, The application of audio-frequency magnetotelluric (AMT) to mineral exploration: Geophysics v. 38, o. 1159-1175.

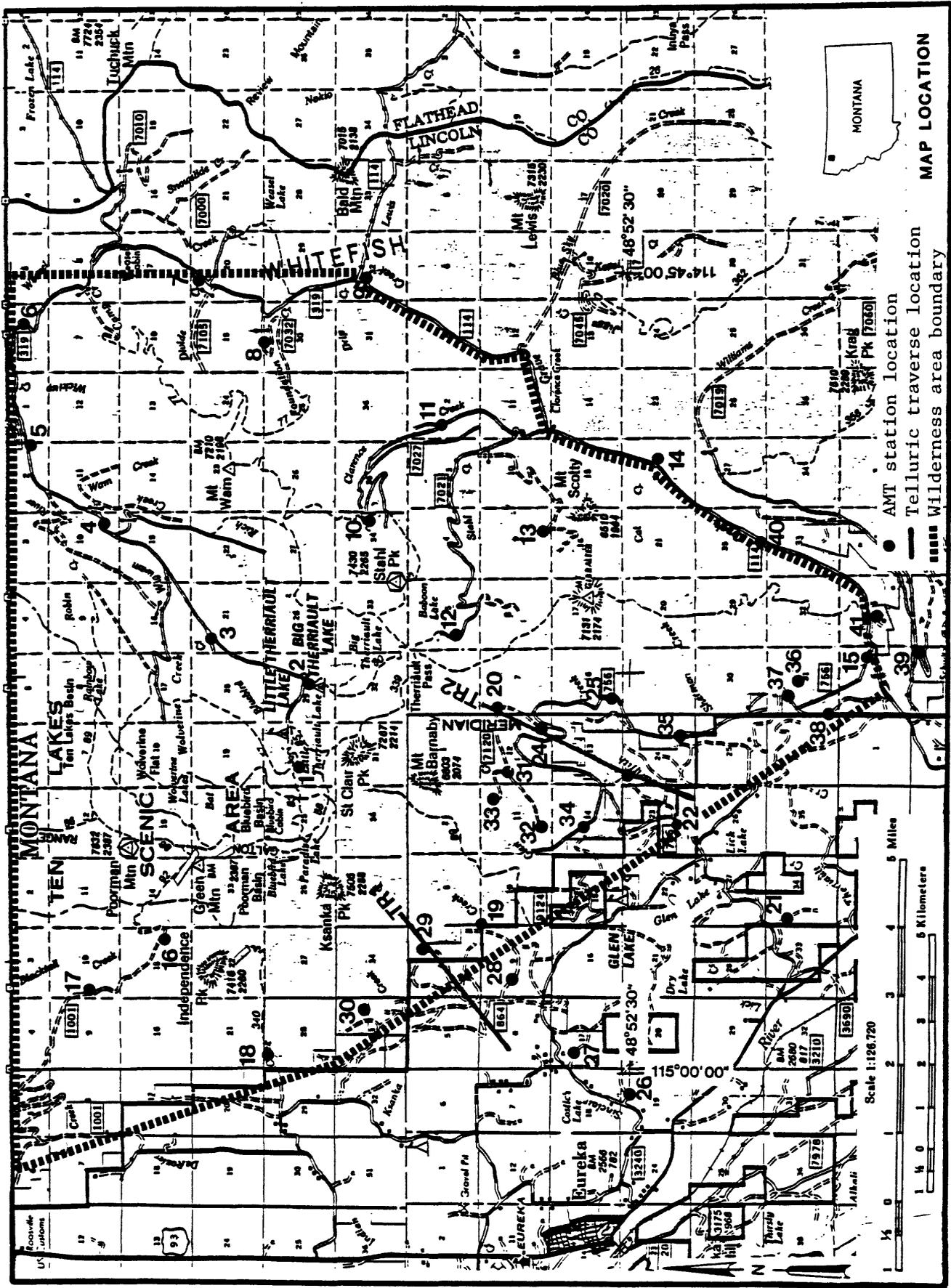


Figure 1. Map showing locations of AMT sounding sites and telluric traverses in the Ten-Lakes Wilderness Study area, Montana.

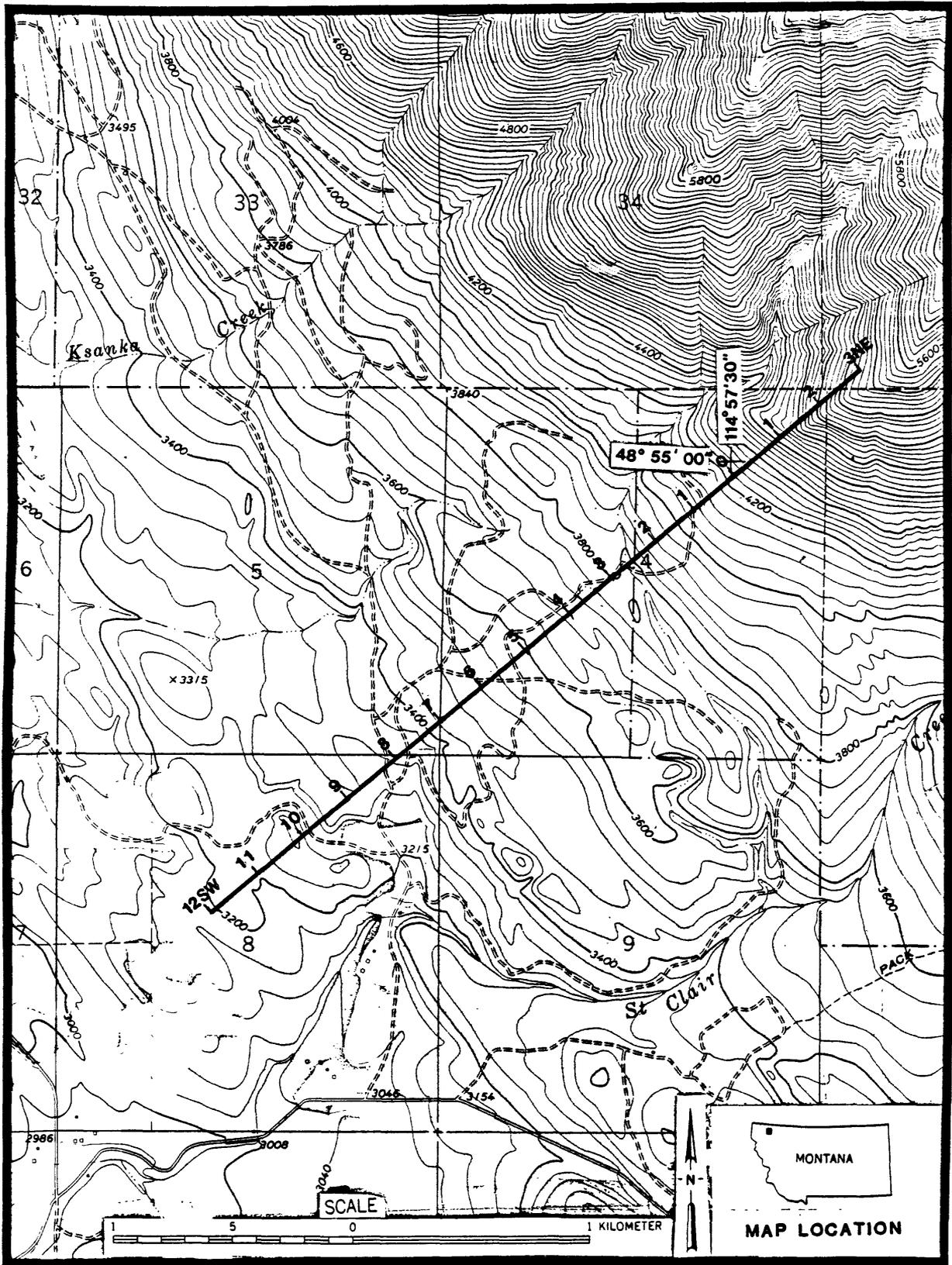


Figure 2. Map showing detailed location of TT No. 1 in the Ten-Lakes Wilderness Study area, Montana. Map base from the USGS Ksanka Peak 7 1/2 minute quadrangle.

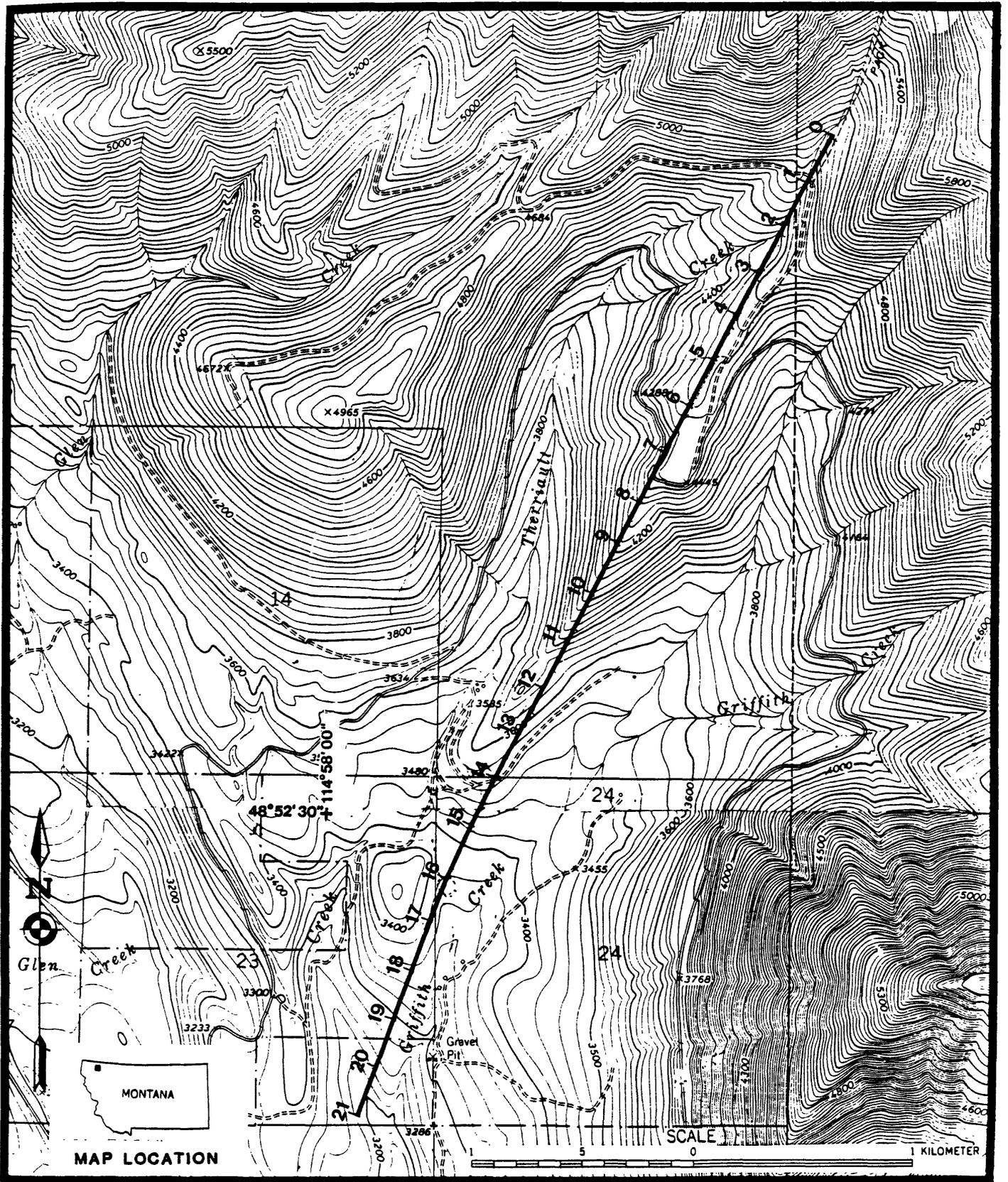


Figure 3. Map showing location of TT No. 2 in the Ten-Lakes Wilderness Study area, Montana. Map base from the USGS Ksanka Peak and Fortime 7 1/2 minute quadrangle.

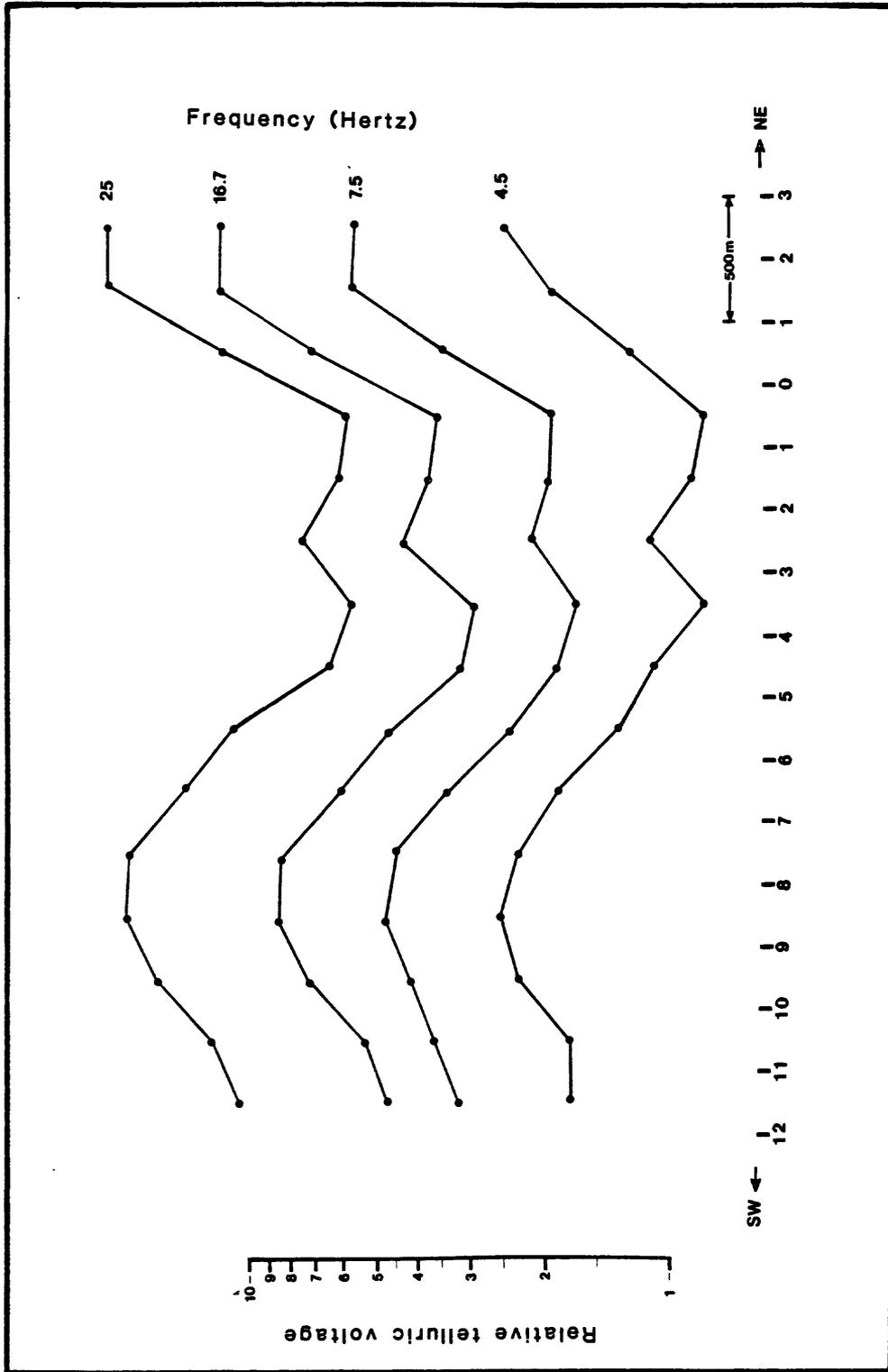


Figure 4. Telluric data for traverse No. 1 Ten-Lakes Wilderness Study area,

Montana.

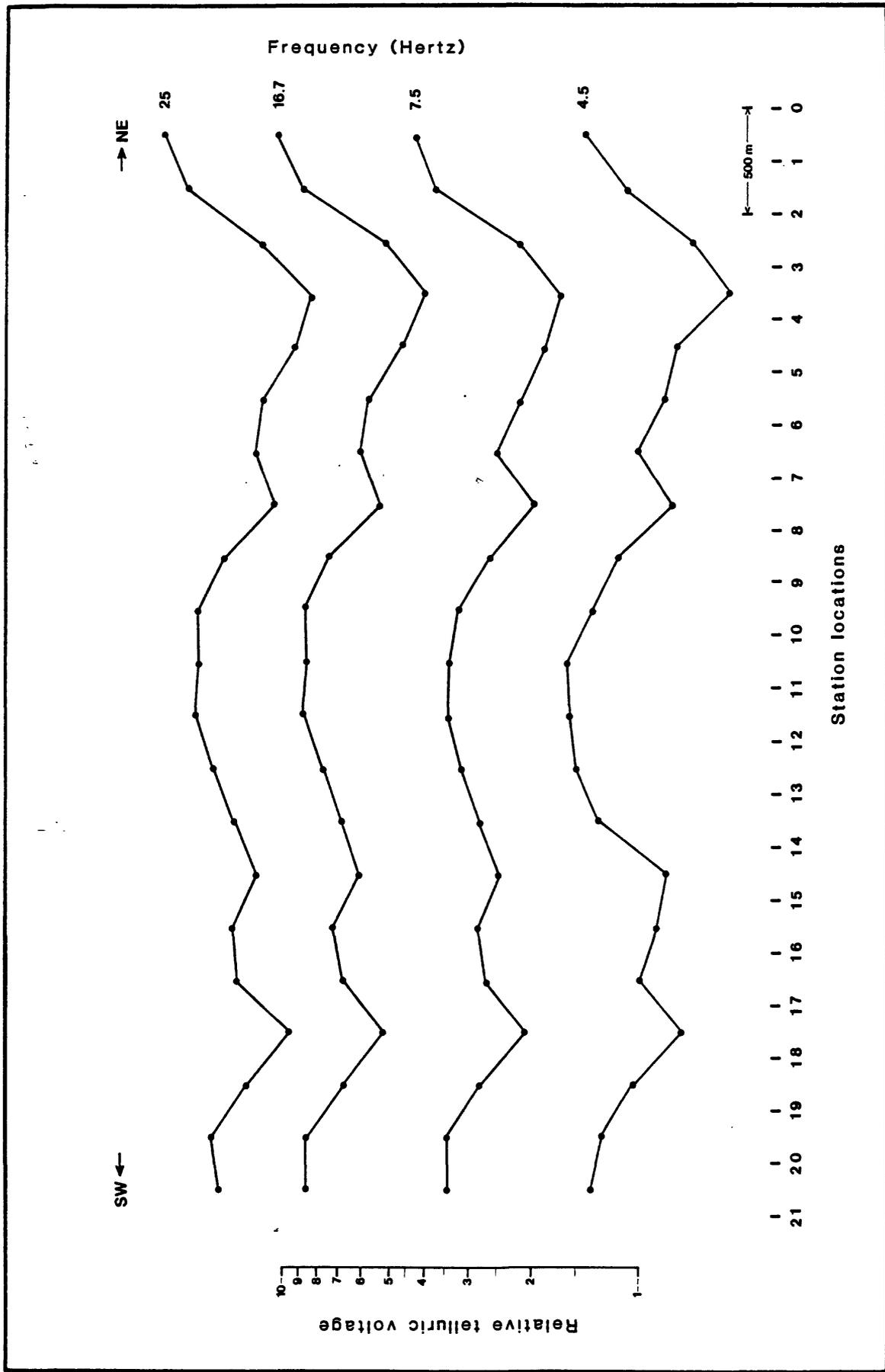


Figure 5. Telluric Data for Traverse No. 2 Ten-Lakes Wilderness Study area, Montana.

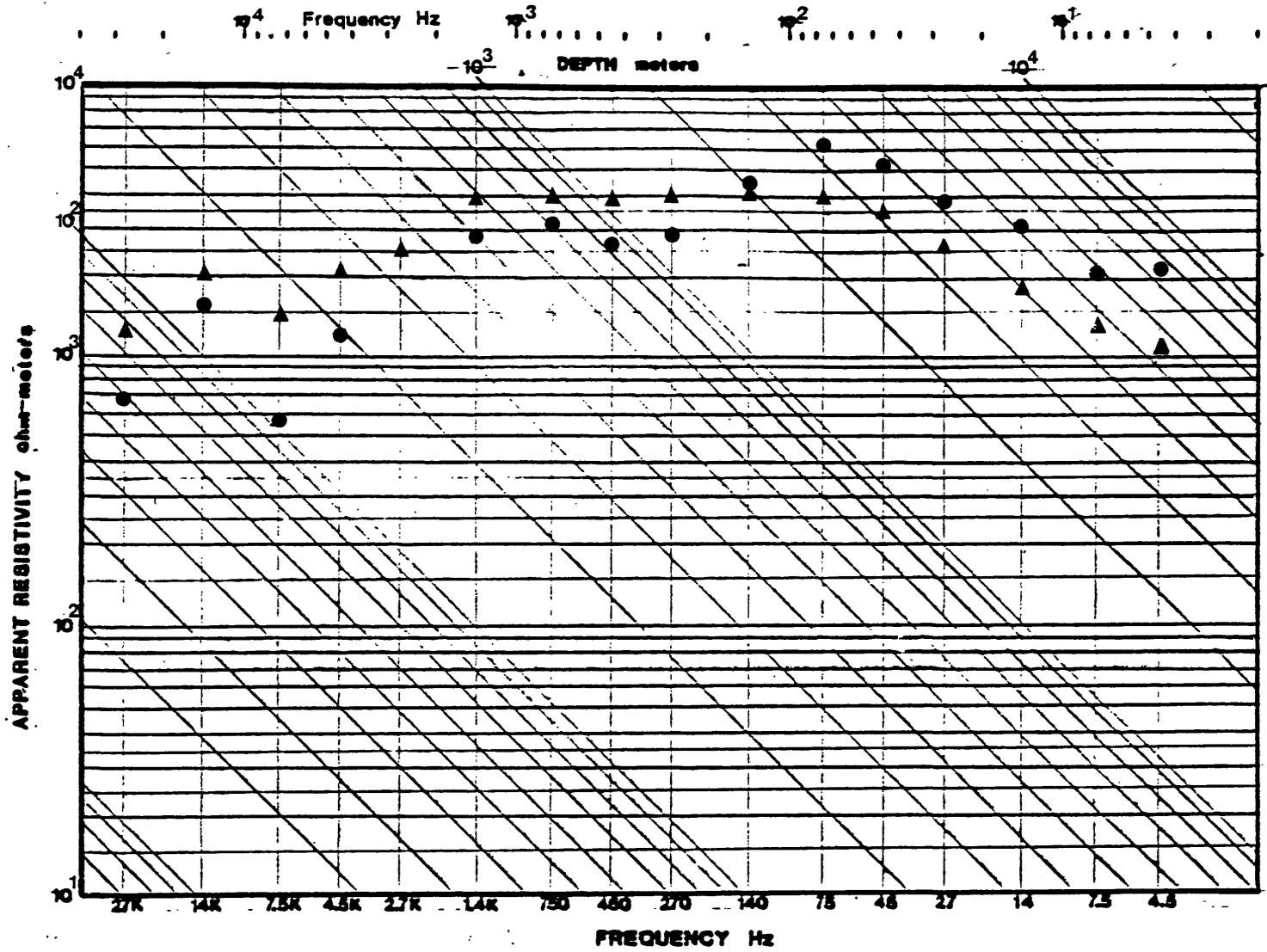
Appendix 1

Audio-magnetotelluric sounding curves and data for the Ten-Lakes, Montana Wilderness Study area. Each figure shows a graph of both scalar AMT soundings obtained for the indicated station. Diagonal lines on the graph indicate the approximate depth of exploration for any resistivity frequency point. The lines are based on a relationship given by Bostick (1977). Below each graph the data are tabulated. Table heading nomenclature is given below.

Freq H _z	Frequency (Hertz)
Pa	Apparent resistivity (ohm-meters)
Na	Number of observations
Error	Standard error (ohm-meters)

USGS Scaler A/M/T Data Log

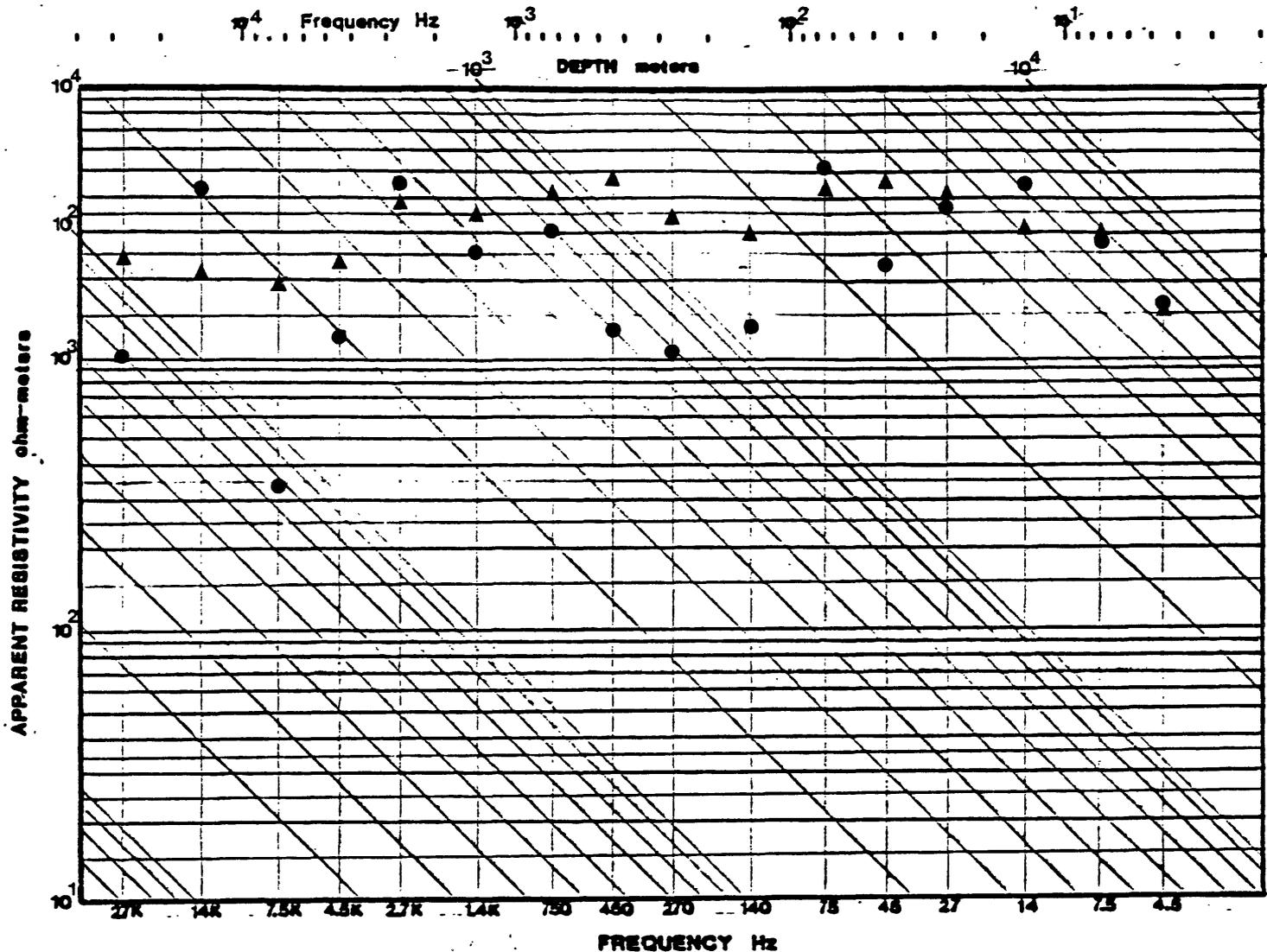
Location 10 Lakes, MT Station 1 Date 8/25/81 Operator DBH, KC



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	P _a	N _a	Error	P _a	N _a	Error		
4.5	2221	6	624	1133	5	259		4.5
7.5	2114	9	271	1317	9	56		7.5
14	3028	13	137	1790	11	60		14
27	3926	10	255	2612	7	199		27
48	5314	11	220	3499	11	197		48
75	6210	11	157	3926	9	140		75
140	4521	10	126	4032	14	187		140
270	2822	9	140	3895	13	170		270
450	2709	10	237	3909	10	267		450
750	3144	4	328	3963	8	198		750
1.4K	2812	3	419	3990	3	99		1.4 K
2.7K	-	-	-	2541	3	69		2.7 K
4.5K	1246	8	117	2061	8	110		4.5 K
7.5K	569	6	25	1415	9	97		7.5 K
14K	1595	5	164	2002	4	46		14 K
27K	675	6	20	1275	5	130		27 K

USGS Scaler A&T Data Log

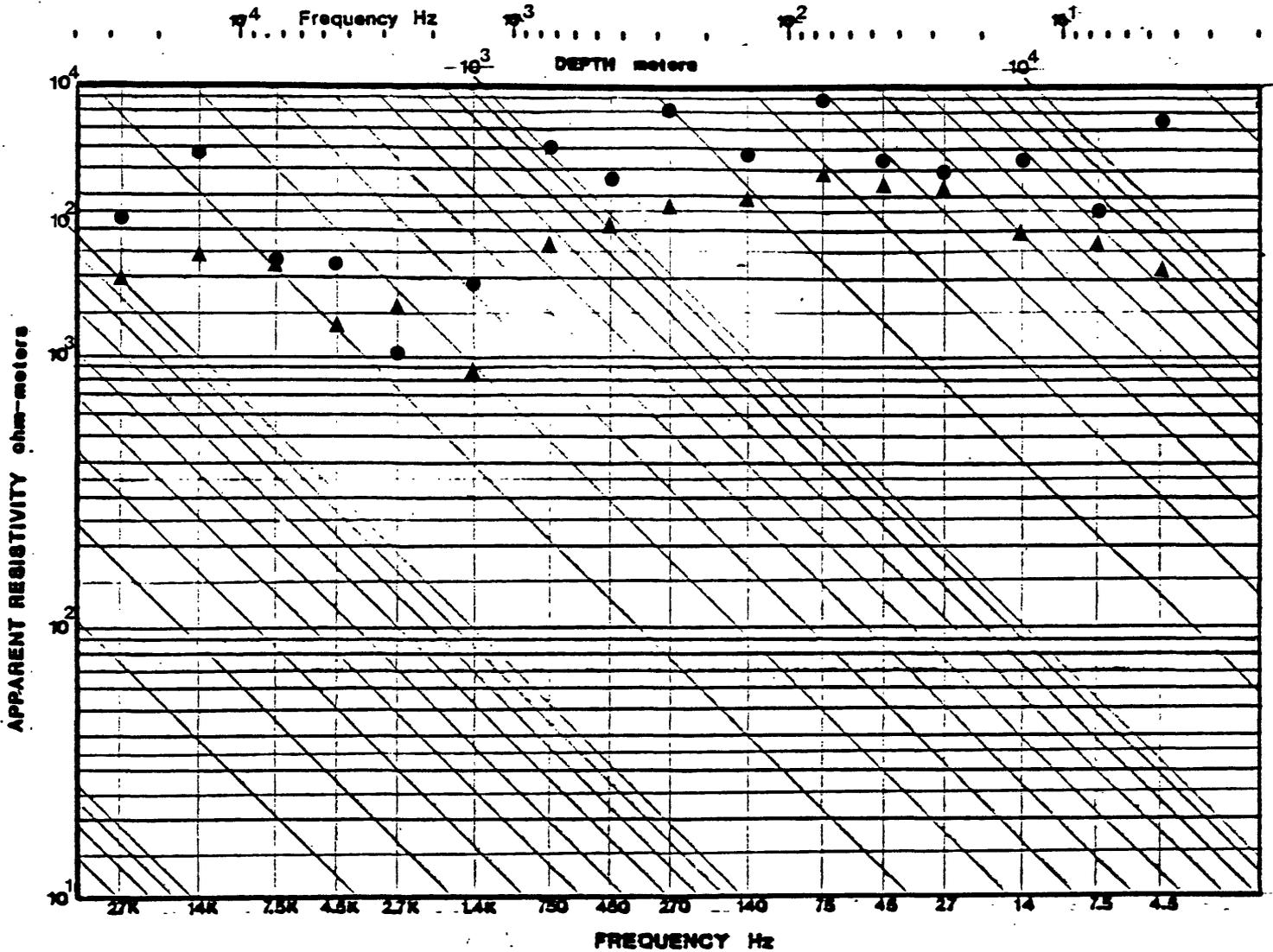
Location 10 Lakes MT Station 2 Date 8/25/81 Operators DPH, KC



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	P _a	No.	Error	P _a	No.	Error		
4.5	1578	5	296	1538	10	96	4.5	
7.5	2796	6	368	2927	7	163	7.5	
14	4997	10	391	3162	9	124	14	
27	3691	9	556	4118	11	348	27	
48	2327	8	269	4658	10	231	48	
75	5193	8	902	4938	10	203	75	
140	1302	9	227	2925	10	330	140	
270	1175	9	178	3366	10	224	270	
480	1303	4	253	4685	9	316	480	
750	3166	6	610	4176	7	469	750	
1.4K	2523	2	2007	3545	4	586	1.4K	
2.7K	4681	2	2312	380	2	628	2.7K	
4.5K	1256	6	268	2372	7	79	4.5K	
7.5K	330	6	52	1968	7	115	7.5K	
14K	4138	4	604	2124	7	50	14K	
27K	1034	5	199	2921	5	264	27K	

USGS Scaler AWT Data Log

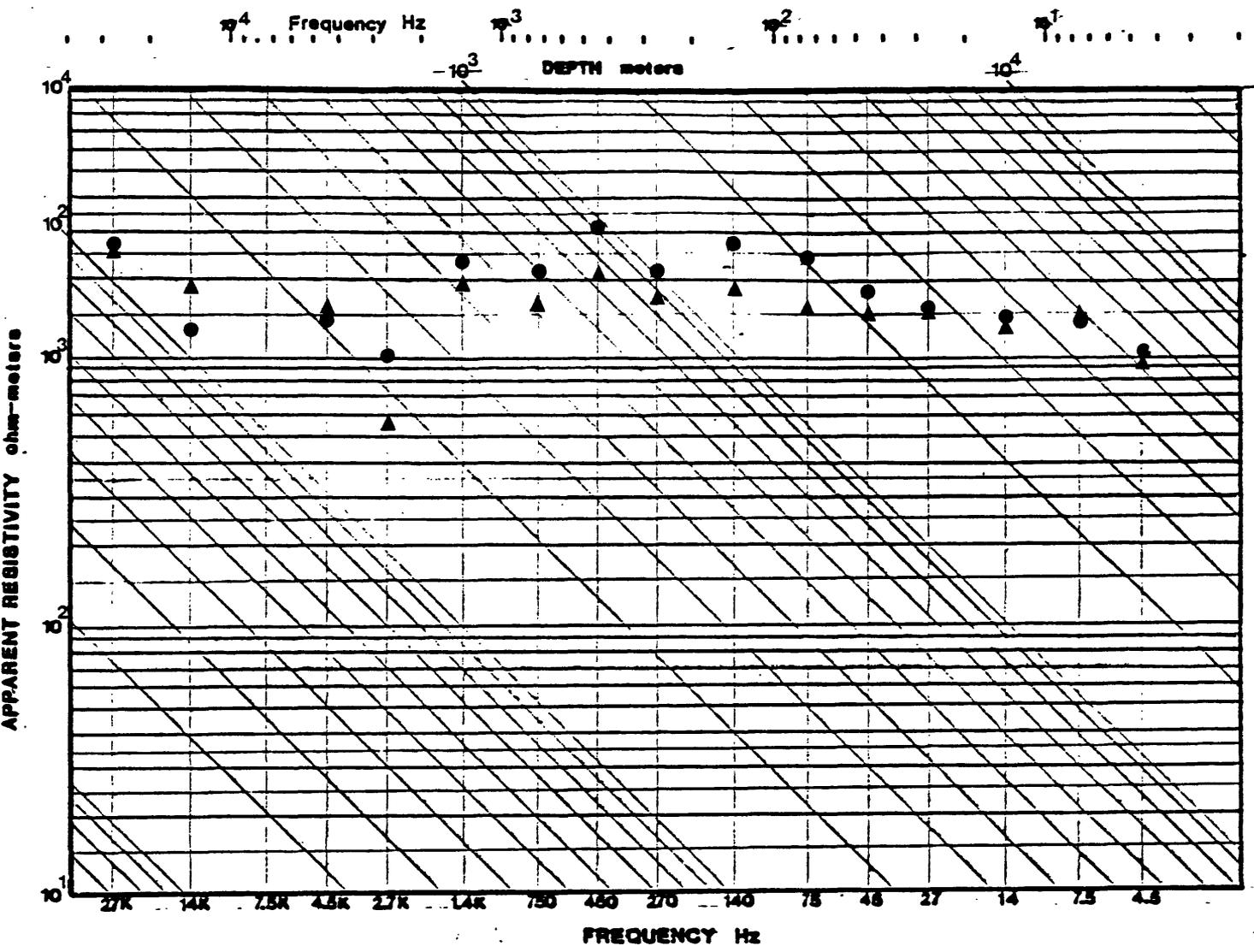
Location 10 Lakes MT Station 3 Date 8/25/81 Operator DBH.KC



Freq. Hz	E-line orientation — N/S ●			E-line orientation — E/W ▲			Remarks	Freq. Hz
	P ₀	Ma	Error	P ₀	Ma	Error		
4.5	1746	5	704	2195	9	255		4.5
7.5	3908	8	531	2707	7	139		7.5
14	5471	7	302	2977	12	141		14
27	4997	9	495	4203	10	150		27
46	5490	9	459	4366	12	136		46
75	4907	9	500	4729	10	309		75
140	5730	9	690	3799	11	197		140
270	8103	10	636	3569	11	107		270
480	4623	10	313	3106	10	96		480
750	6179	9	1171	2144	10	92		750
1.4K	1325	5	79	839	8	75		1.4 K
2.7K	1086	5	169	1560	5	327		2.7 K
4.5K	2211	7	139	1271	6	200		4.5 K
7.5K	2398	7	276	2260	8	156		7.5 K
14K	5740	4	375	2404	4	36		14 K
27K	3280	6	149	1967	4	104		27 K

USGS Scaler A&T Data Log

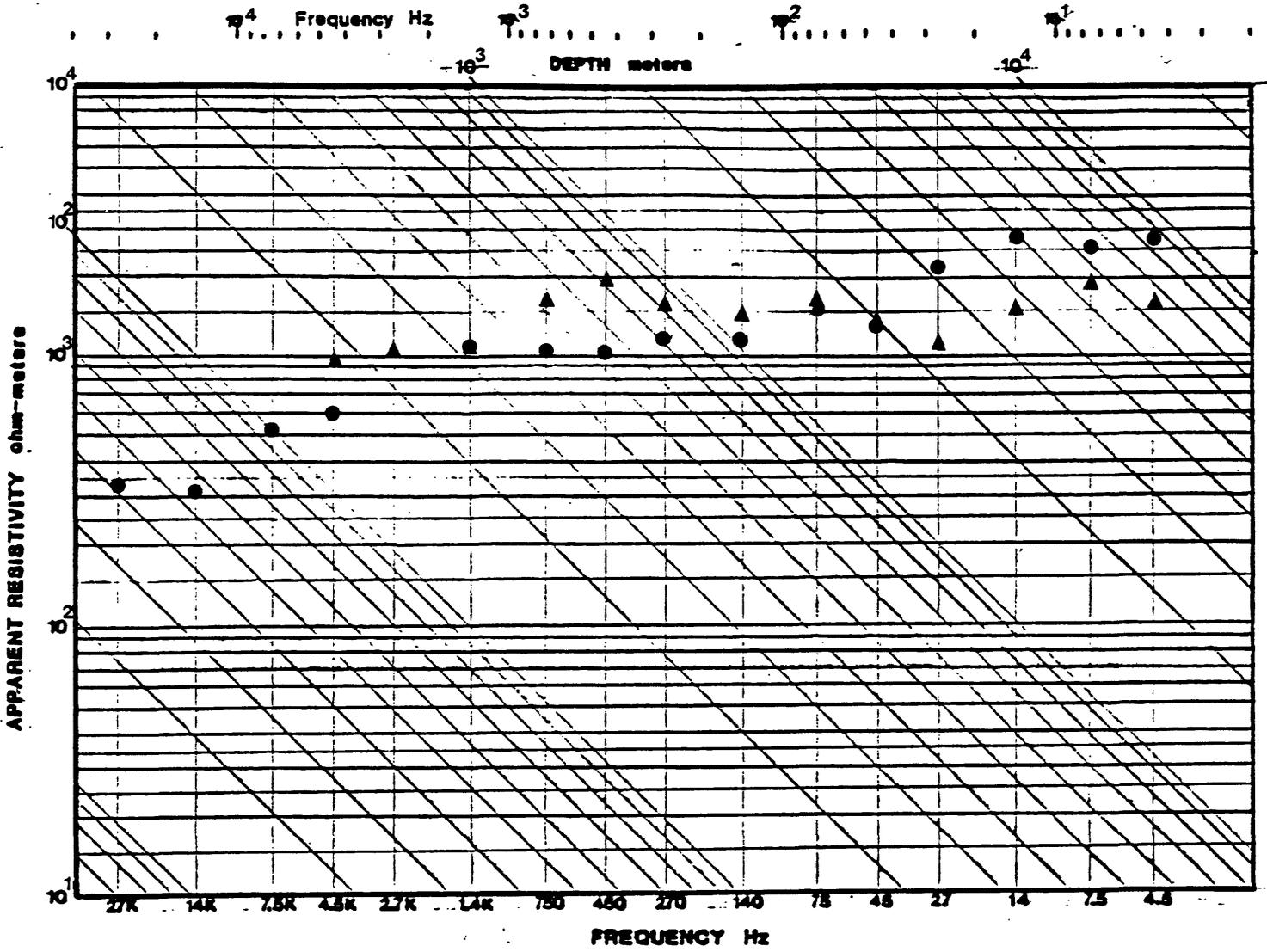
Location 10 Lakes, MT Station 4 Date 8/25/81 Operators DRA KC



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	P _a	No.	Error	P _a	No.	Error		
4.5	1065	6	174	905	9	99	4.5	
7.5	1374	9	68	1967	7	99	7.5	
14	1478	9	54	1350	10	84	14	
27	1569	10	64	1526	11	35	27	
45	1870	11	115	1493	11	45	45	
75	2421	11	98	1583	12	67	75	
140	2771	12	214	1807	13	104	140	
270	2171	10	49	1741	8	104	270	
450	3570	10	86	2107	11	189	450	
750	2164	12	76	1698	9	56	750	
1.4K	2403	7	328	1968	6	297	1.4 K	
2.7K	1008	4	180	561	5	161	2.7 K	
4.5K	1473	10	73	1602	11	137	4.5 K	
7.5K							7.5 K	
14K	1360	7	103	1843	5	33	14 K	
27K	2747	5	148	2556	5	94	27 K	

USGS Scaler A/T Data Log

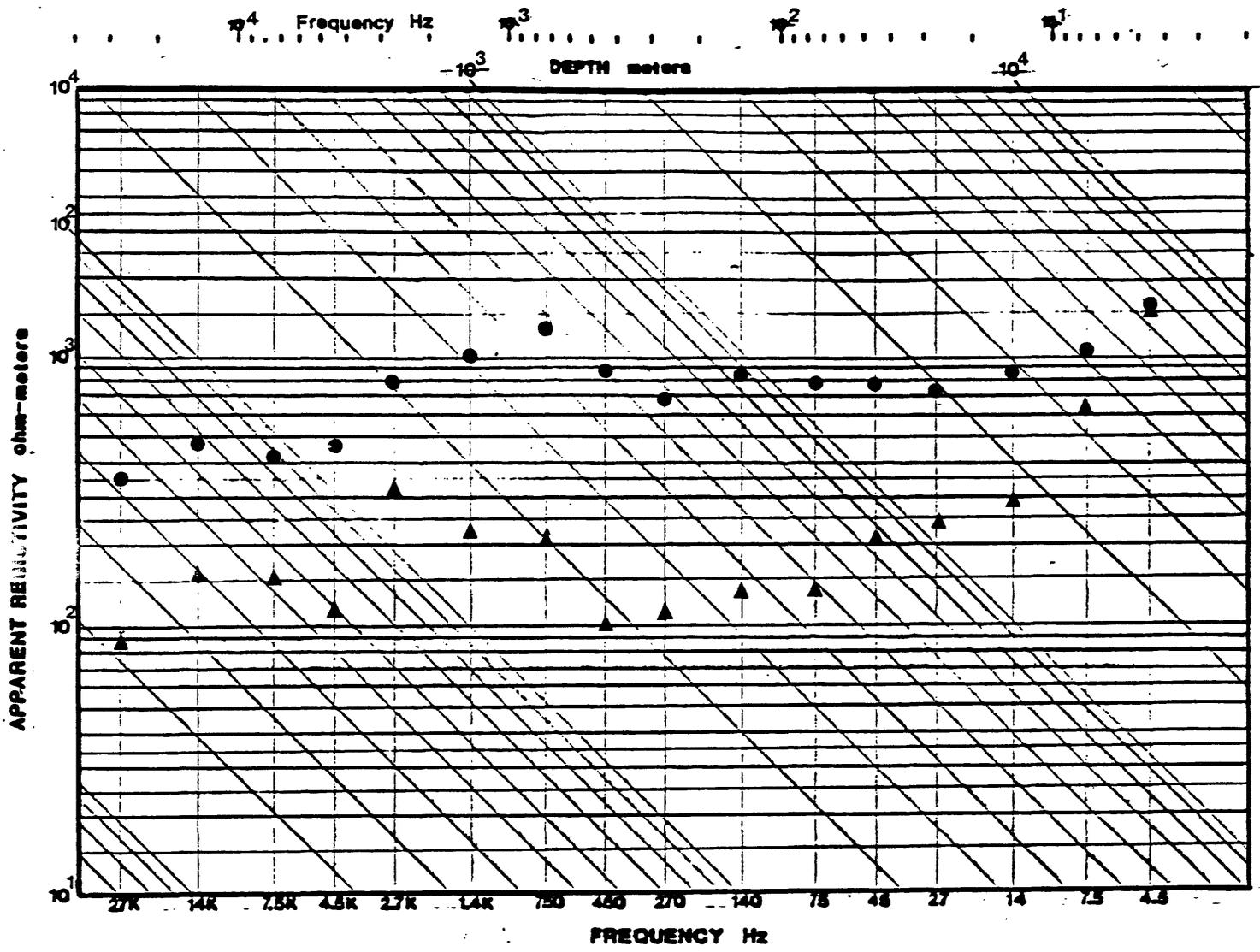
Location 10 Lakes, MT Station 5 Date 8-7-81 Operators DBH, DMN



Freq. Hz	E-line orientation -- N/S ●			E-line orientation -- E/W ▲			Remarks	Freq. Hz
	P _a	No.	Error	P _a	No.	Error		
4.5	2809	7	273	1625	9	102		4.5
7.5	2653	10	166	1899	10	210		7.5
14	2779	10	160	1569	10	81		14
27	2191	9	134	1241	9	54		27
48	1307	10	44	1398	11	79		48
75	1528	11	37	1666	9	97		75
140	1196	11	21	1491	10	106		140
270	1140	9	36	1610	10	52		270
450	1269	10	42	1457	11	67		450
750	1090	11	52	1681	12	72		750
1.4K	1118	10	25	1118	11	111		1.4 K
2.7K	471	5	207	1150	6	156		2.7 K
4.5K				943	11	70		4.5 K
7.5K				10				7.5 K
14K								14 K
27K								27 K

USGS Scaler A&T Data Log

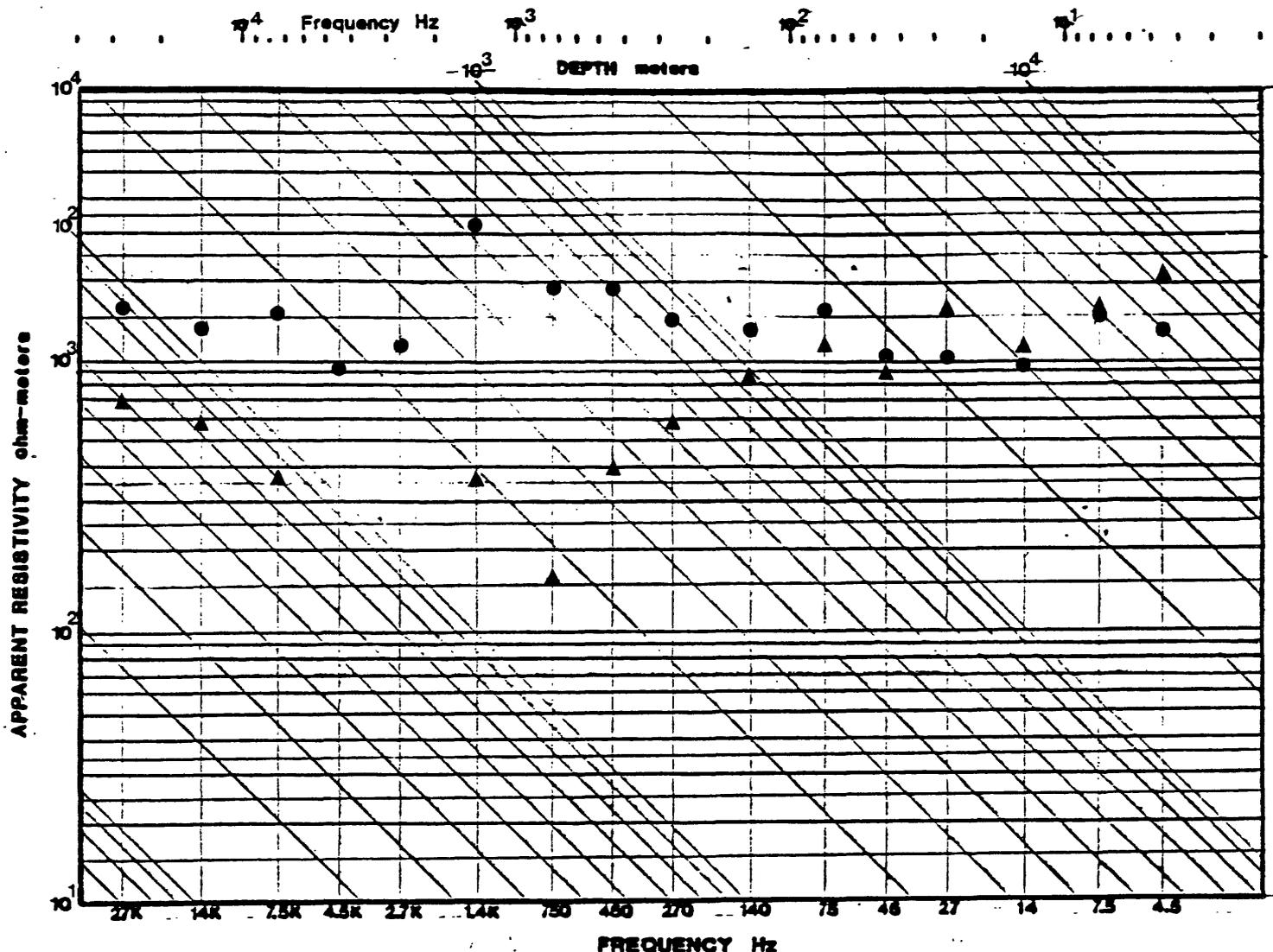
Location 10 Lake MT Station 6 Date 8-27-81 Operators DBH, DMN



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	Pg	Ma	Error	Pg	Ma	Error		
4.5	1683	7	163	1601	2	537	4.5	
7.5	1080	5	45	613	11	54	7.5	
14	854	9	33	286	9	34	14	
27	722	9	19	234	4	16	27	
46	714	9	60	222	8	19	46	
75	755	10	31	141	11	19	75	
140	815	11	45	141	10	77	140	
270	691	10	28	121	10	11	270	
450	894	11	59	44	9	12	450	
750	1288	11	52	212	7	31	750	
1.4K	999	9	113	230	8	35	1.4 K	
2.7K	764	8	34	331	10	23	2.7 K	
4.5K	468	11	22	123	11	16	4.5 K	
7.5K	408	11	29	158	10	13	7.5 K	
14K	481	9	37	159	8	7.0	14 K	
27K	398	10	11	85	9	17	27 K	

USGS Scaler A&T Data Log

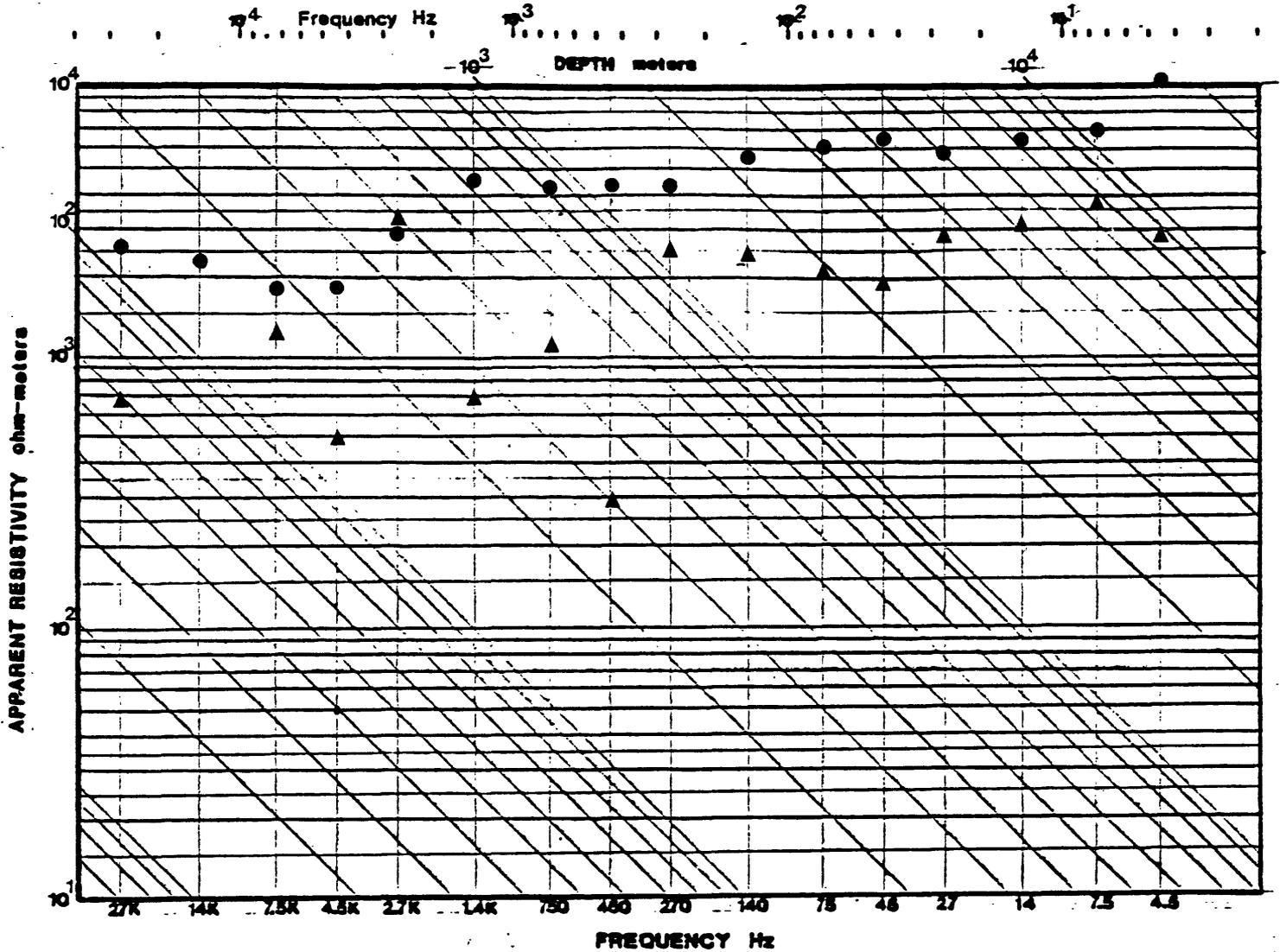
Location 10 Lakes, MT Station 7 Date 8-27-81 Operators DBH, DMN



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	P _a	No.	Error	P _a	No.	Error		
4.5	1354	7	126	2217	9	1276	4.5	
7.5	1503	4	130	1567	10	198	7.5	
14	968	8	92	1218	4	160	14	
27	1050	8	28	1585	7	184	27	
46	1018	8	53	887	6	275	46	
75	1561	6	239	1150	7	209	75	
140	1327	9	106	853	6	105	140	
270	1453	6	172	589	7	137	270	
460	2454	7	181	380	5	197	460	
750	1932	7	112	160	3	89	750	
1.4K	3253	5	525	362	3	20	1.4 K	
2.7K	1229	3	60	-	-	-	2.7 K	
4.5K	907	9	104	-	-	-	4.5 K	
7.5K	1510	4	132	362	7	33	7.5 K	
14K	1448	3	110	589	3	57	14 K	
27K	1680	3	77	690	3	114	27 K	

USGS Scaler A&T Data Log

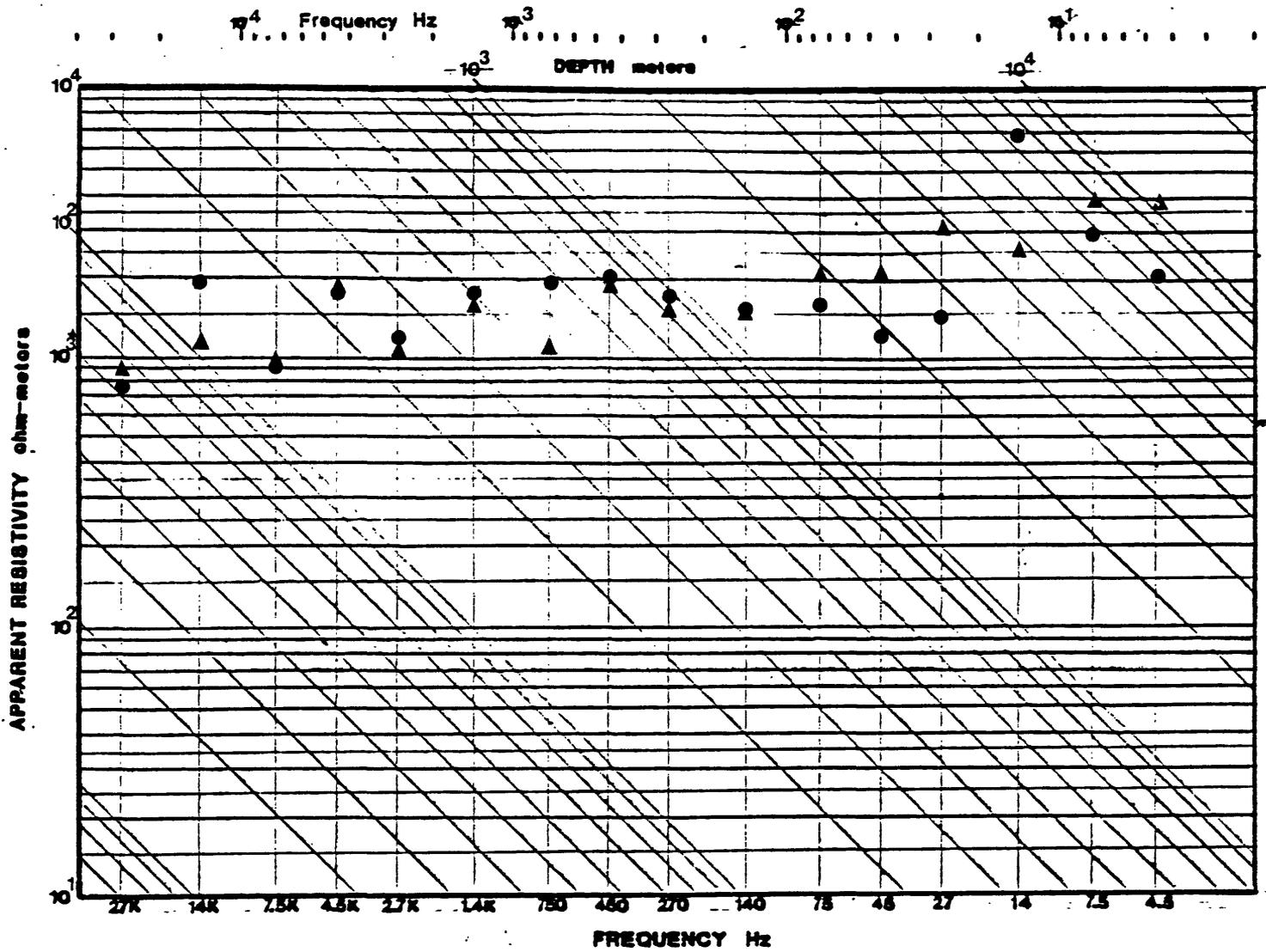
Location 10 Lakes, MT Station 8 Date 8-27-81 Operators DBH, DMN



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	Pa	Ma	Error	Pa	Ma	Error		
4.5	11100	4	4447	2788	3	1429	4.5	
7.5	6842	6	623	4908	7	903	7.5	
14	6411	8	720	3125	6	433	14	
27	5963	7	130	2791	6	427	27	
45	6630	7	685	1906	8	288	45	
75	6146	9	499	2192	9	191	75	
140	5677	7	479	2412	6	216	140	
270	4927	10	161	2488	7	221	270	
450	4339	5	252	279	5	37	450	
750	4286	11	263	1168	5	295	750	
1.4K	4661	10	344	676	2	802	1.4 K	
2.7K	2909	3	727	3337	2	705	2.7 K	
4.5K	1888	8	144	499	8	39	4.5 K	
7.5K	1920	10	87	1274	5	187	7.5 K	
14K	2367	8	226	-	-	-	14 K	
27K	3689	6	125	680	4	44	27 K	

USGS Scaler A&T Data Log

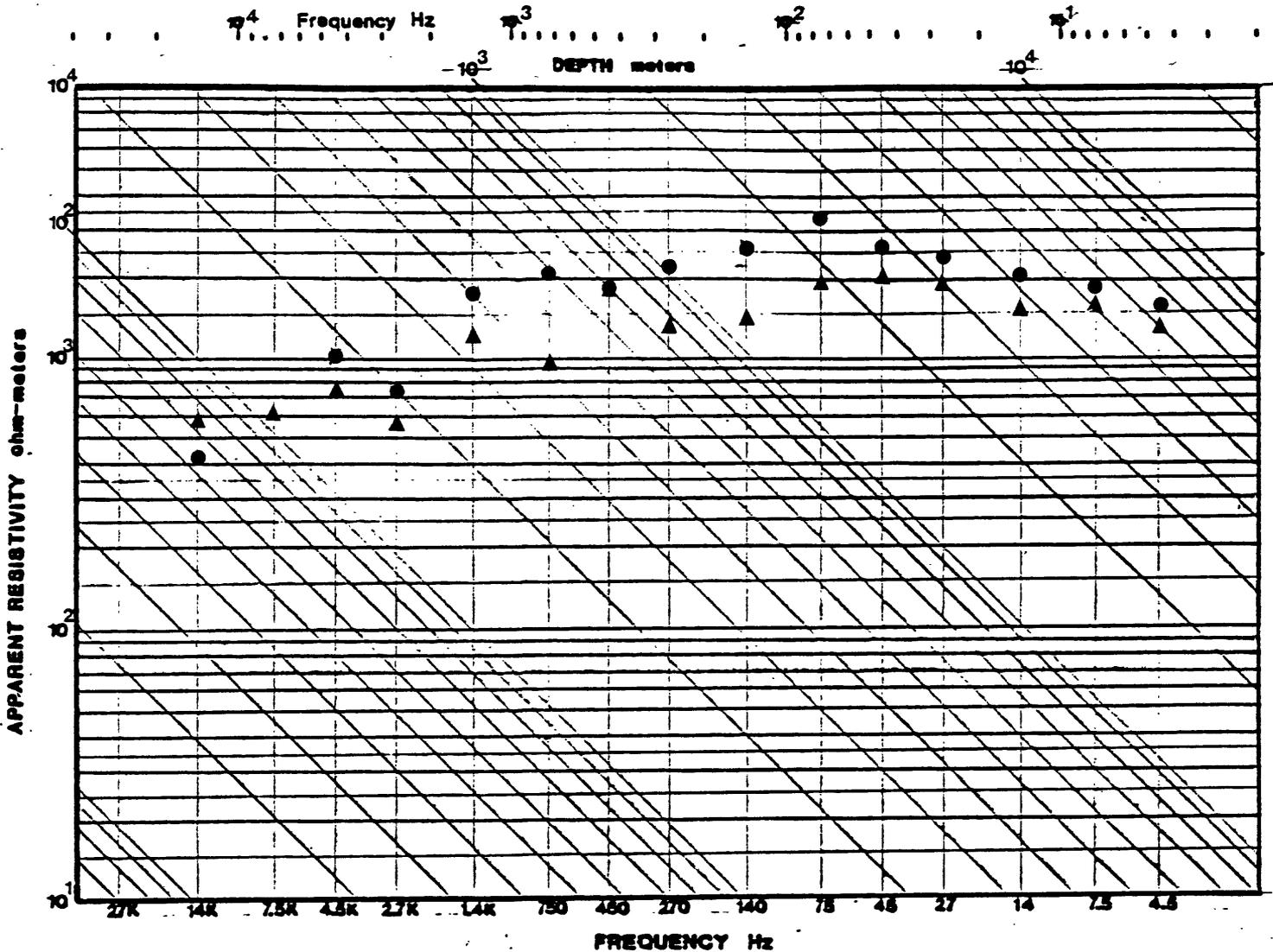
Location 10 lakes MT Station 9 Date 8-27-81 Operators DRH, JMN



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	P _a	No.	Error	P _a	No.	Error		
4.5	2271	5	192	3914	9	739		4.5
7.5	2930	6	236	3733	9	198		7.5
14	6448	12	628	2508	13	206		14
27	1936	11	59.0	3056	13	246		27
45	1327	8	41	2191	10	123		45
75	1633	13	75	2105	13	139		75
140	1651	13	53	1524	12	51		140
270	1710	12	57	1589	13	133		270
450	2032	13	75	1804	10	190		450
750	1930	11	65	1154	12	53		750
1.4K	1808	13	195	1580	9	211		1.4 K
2.7K	1291	9	81	1187	16	84		2.7 K
4.5K	1741	14	114	1846	11	60		4.5 K
7.5K	909	10	77	144	11	39		7.5 K
14K	1910	7	124	1151	9	43		14 K
27K	785	7	59	894	9	61		27 K

USGS Scaler A/T Data Log

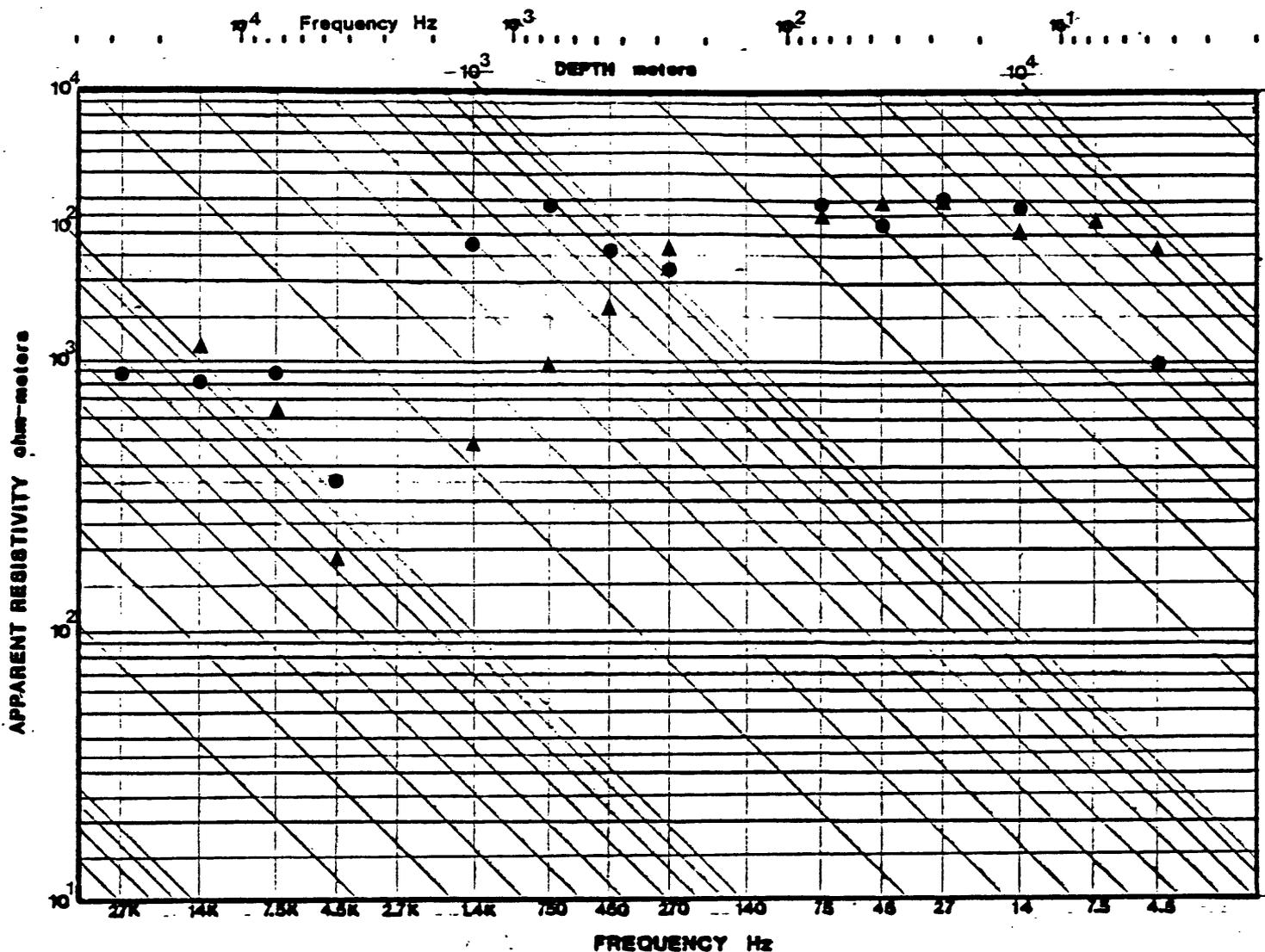
Location 10 lakes MT Station 10 Date 8-27-81 Operator DBH DMU



Freq. Hz	E-line orientation -- N/S ●			E-line orientation -- E/W ▲			Remarks	Freq. Hz
	P _a	No.	Error	P _a	No.	Error		
4.5	1604	11	239	1332	7	127		4.5
7.5	1959	11	118	1606	9	200		7.5
14	2050	10	128	1525	8	121		14
27	2453	11	124	1937	11	123		27
45	2646	11	244	2018	11	183		45
75	2933	11	137	1919	11	123		75
140	2233	11	210	1935	11	85		140
270	1734	11	56	1374	11	69		270
450	1843	11	45	1814	9	154		450
750	2111	13	219	931	10	64		750
1.4K	1810	11	134	1246	11	92		1.4 K
2.7K	744	10	128	575	11	72		2.7 K
4.5K	1006	10	50	752	10	31		4.5 K
7.5K	-	-	-	618	10	47		7.5 K
14K	423	10	14	590	10	28		14 K
27K	-	-	-	-	-	-		27 K

USGS Scaler AMT Data Log

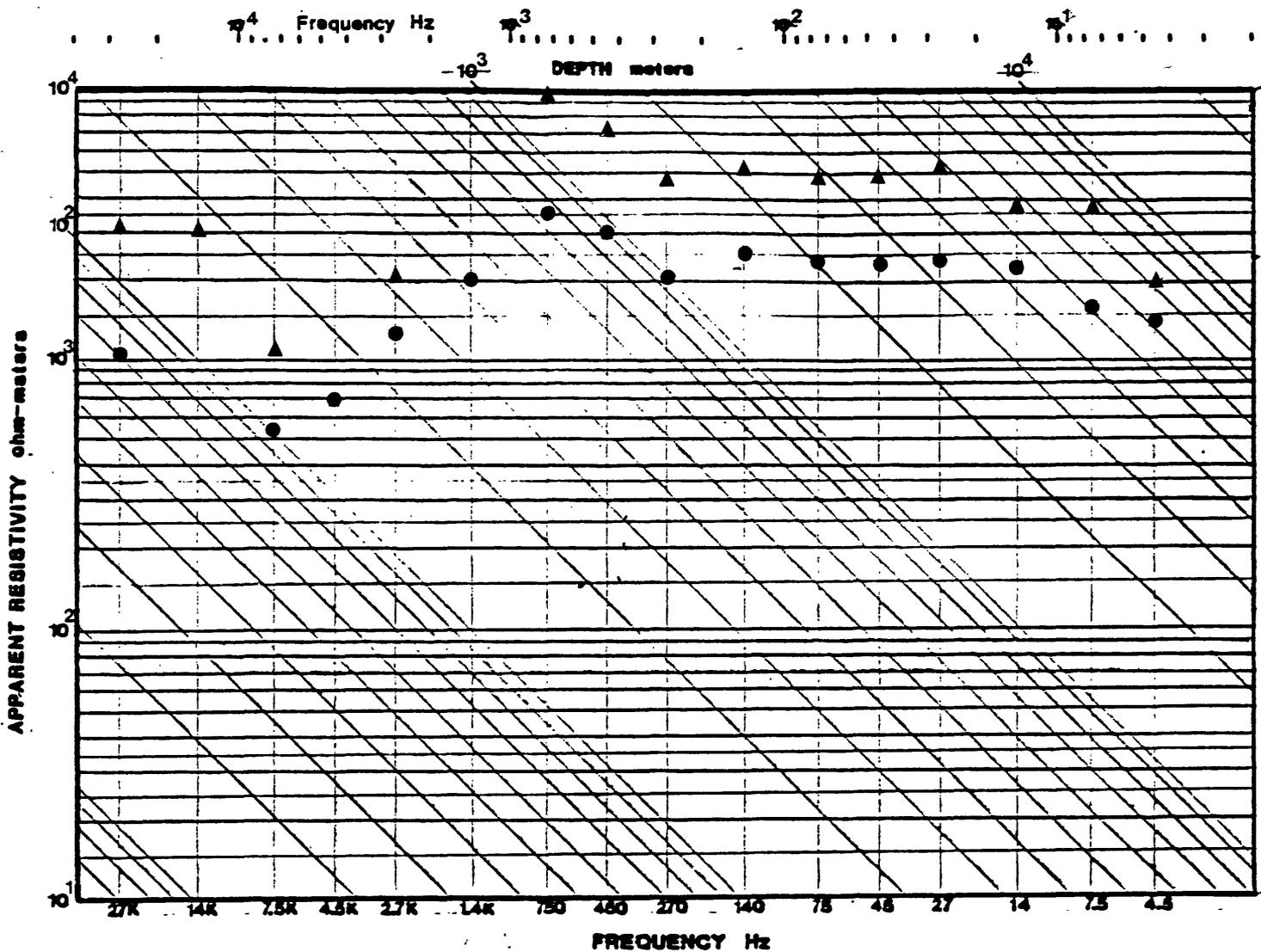
Location 10 Lakes, MT Station 11 Date 8-28-81 Operators DBH, DMW



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	Pa	Ma	Error	Pa	Ma	Error		
4.5	994	5	95	2633	6	213	4.5	
7.5	3430	5	547	3239	4	72	7.5	
14	3730	8	301	3015	8	87	14	
27	3832	9	297	3864	9	117	27	
46	3220	8	181	3882	8	126	46	
75	3876	5	153	3417	7	166	75	
140	-	-	-	-	-	-	140	
270	2278	9	146	2665	10	332	270	
460	2194	6	225	1563	6	97	460	
750	3848	5	452	928	4	15	750	
1.4K	2764	3	368	486	4	60	1.4 K	
2.7K	-	-	-	-	-	-	2.7 K	
4.5K	353	6	60	176	8	31	4.5 K	
7.5K	882	8	135	631	11	68	7.5 K	
14K	824	6	114	1118	6	43	14 K	
27K	868	4	68	-	-	-	27 K	

USGS Scaler AMT Data Log

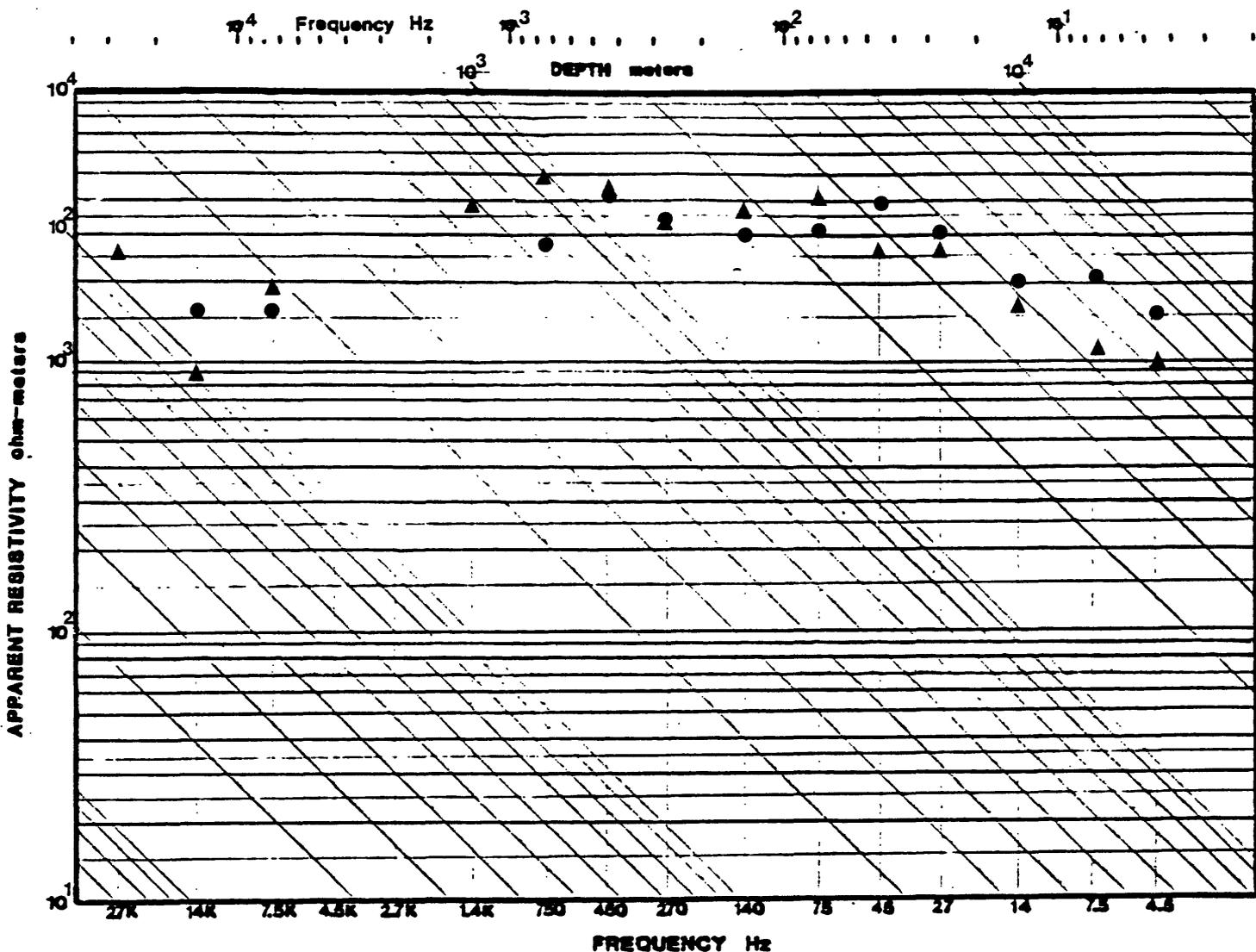
Location 10 Lakes MT Station 12 Date 8-28-81 Operators DBH DMN



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	P _a	N _a	Error	P _a	N _a	Error		
4.5	1415	7	278	1900	7	235		4.5
7.5	1672	7	134	3676	7	475		7.5
14	2271	11	150	3696	11	369		14
27	2392	11	121	5907	10	352		27
46	2296	10	337	4905	10	390		46
75	2370	7	195	4753	9	306		75
140	2550	11	312	5015	7	852		140
270	2111	10	293	4894	9	510		270
450	3018	9	182	7212	7	1125		450
750	3548	8	195	9919	8	590		750
1.4K	2042	6	223	-	-	-		1.4K
2.7K	1291	4	131	2582	2	1286		2.7K
4.5K	674	3	77	-	-	-		4.5K
7.5K	532	2	23	1268	1	124		7.5K
14K	-	-	-	3076	2	0		14K
27K	1105	5	46	3166	2	.113		27K

USGS Sealer ALT Data Log

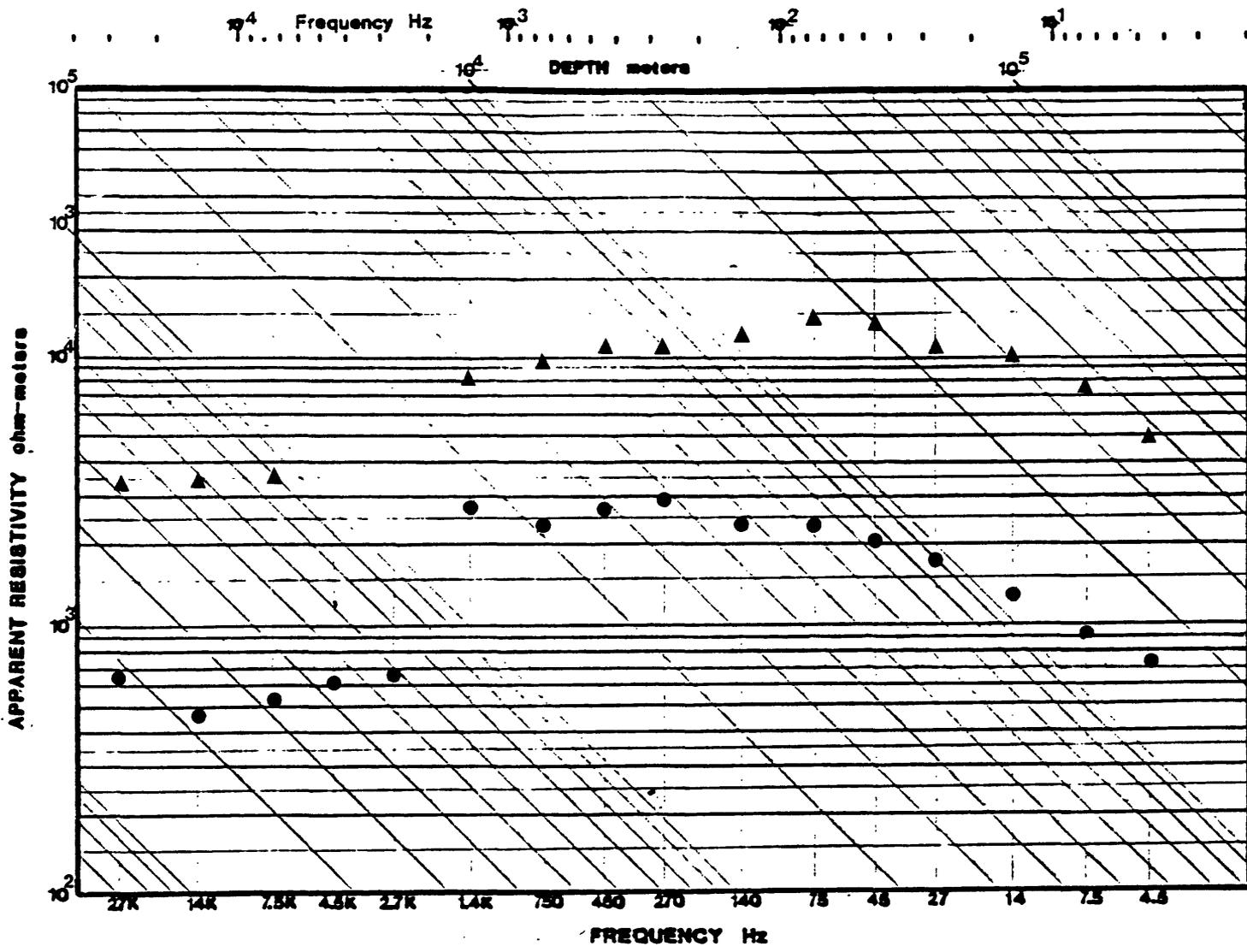
Location 10 Lakes, MT Station 13 Date 8-28-81 Operator DBH, DMW



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Pa	Ma	Error	Pa	Ma	Error		
4.5	1530	9	190	999	7	120		4.5
7.5	2121	9	129	1210	9	105		7.5
14	2091	9	73	1713	9	83		14
27	3019	9	182	2619	9	122		27
48	3910	9	179	2699	10	188		48
75	3089	9	136	4128	10	280		75
140	3004	9	288	3672	8	146		140
270	3436	8	79	3380	9	95		270
450	4107	9	246	4499	9	206		450
750	3302	9	92	4768	8	260		750
1.4K	-	-	-	3831	11	436		1.4K
2.7K	-	-	-	-	-	-		2.7K
4.5K	-	-	-	-	-	-		4.5K
7.5K	1626	9	93	1873	9	42		7.5K
14K	1528	9	192	883	5	112		14K
27K	-	-	-	2570	5	86		27K

USGS Sealer AL/T Data Log

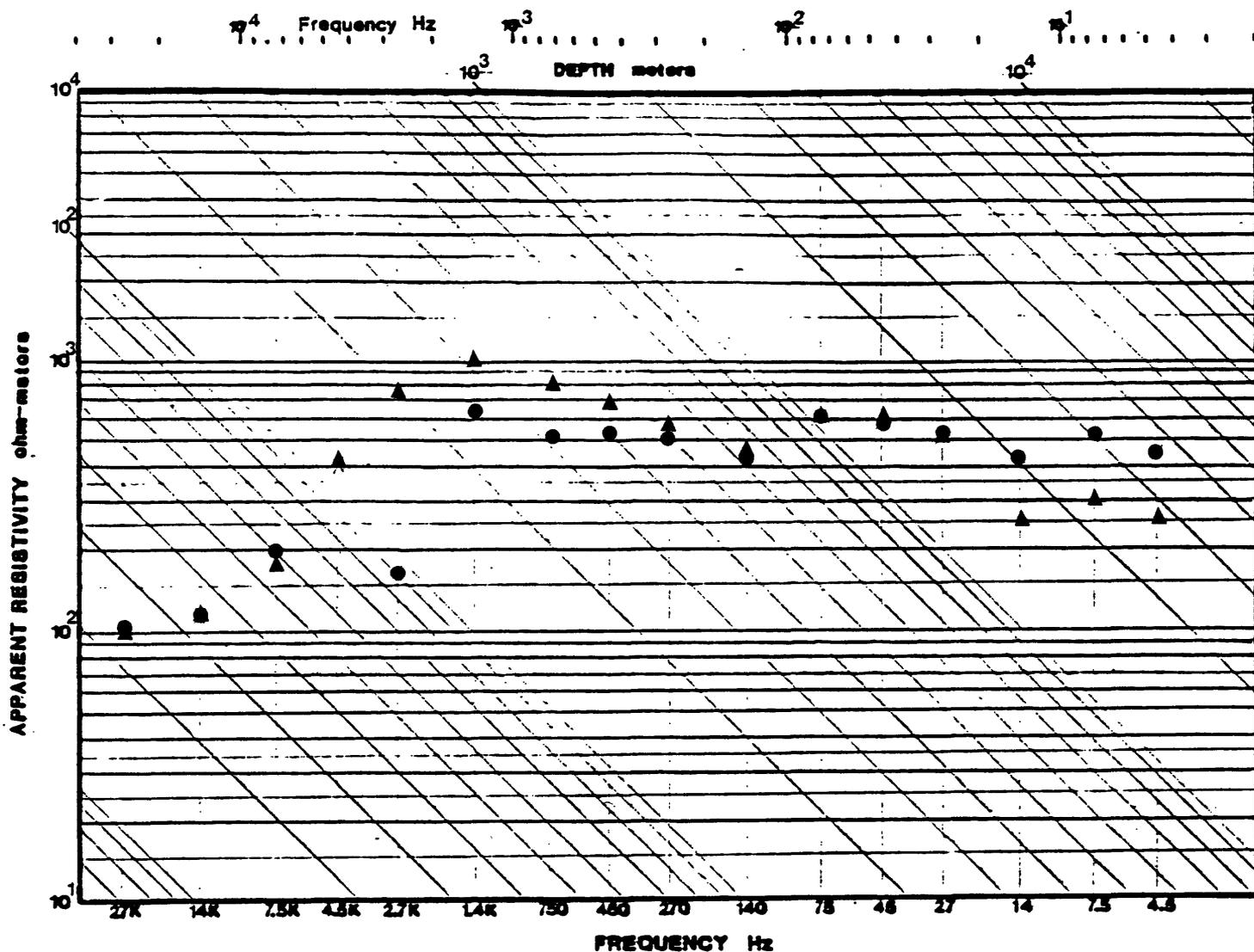
Location 10 Lakes MT Station 14 Date 8-28-81 Operators DBH, DMEN



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	Pa	Ma	Error	Pa	Ma	Error		
4.5	731	7	41	4938	8	289	4.5	
7.5	438	4	87	7751	6	235	7.5	
14	1289	10	25	10056	13	341	14	
27	1776	9	118	11760	12	255	27	
46	2087	10	163	13326	8	1069	46	
75	2339	11	194	13622	7	1165	75	
140	2319	8	406	13179	7	477	140	
270	2969	12	141	11079	11	372	270	
460	2742	9	180	11771	7	1090	460	
750	2391	9	113	9020	7	270	750	
1.4K	2745	6	243	8312	8	675	1.4K	
2.7K	664	3	367	-	-	-	2.7K	
4.5K	629	7	65	-	-	-	4.5K	
7.5K	549	8	68	2582	10	164	7.5K	
14K	475	4	58	3391	2	0	14K	
27K	660	6	157	3356	8	204	27K	

USGS Sealer ALIT Data Log

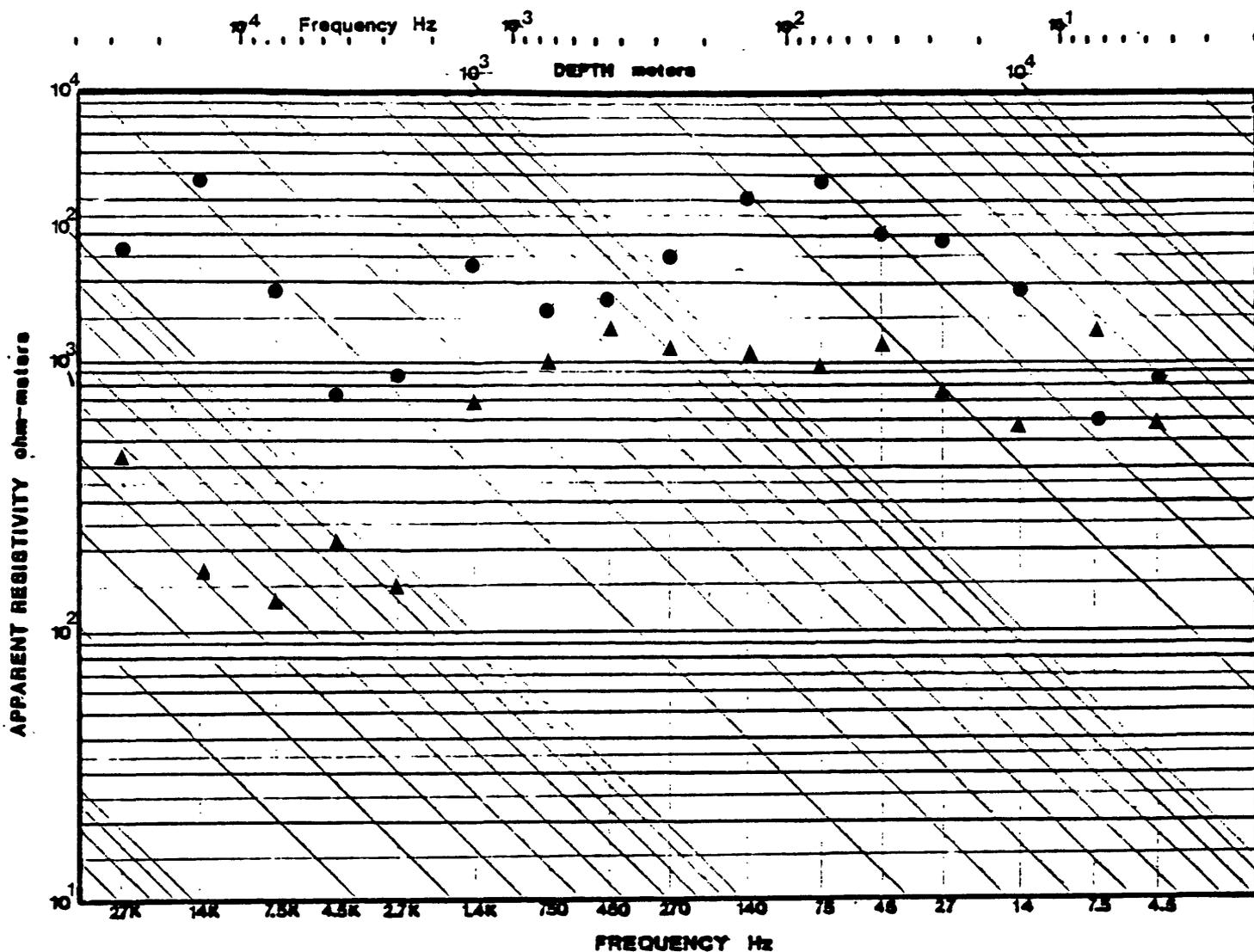
Location 10 Lakes MT Station 15 Date 9-29-82 Operators DBH, DMEN



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	Pa	Na	Error	Pa	Na	Error		
4.5	450	4	52	305	5	80	4.5	
7.5	527	6	82	344	7	49	7.5	
14	433	7	48	323	7	29	14	
27	512	7	53	526	6	29	27	
45	593	7	30	601	7	103	45	
75	624	5	23	606	7	35	75	
140	493	5	57	481	6	49	140	
270	511	5	33	581	5	84	270	
450	551	7	28	676	5	80	450	
750	541	5	31	805	4	91	750	
1.4K	640	5	37	1111	4	178	1.4 K	
2.7K	172	3	43	755	4	107	2.7 K	
4.5K	401	5	42	408	5	20	4.5 K	
7.5K	200	5	8	166	6	10	7.5 K	
14K	139	5	8	131	6	7	14 K	
27K	111	5	7	100	5	14	27 K	

USGS Scalar ALT Data Log

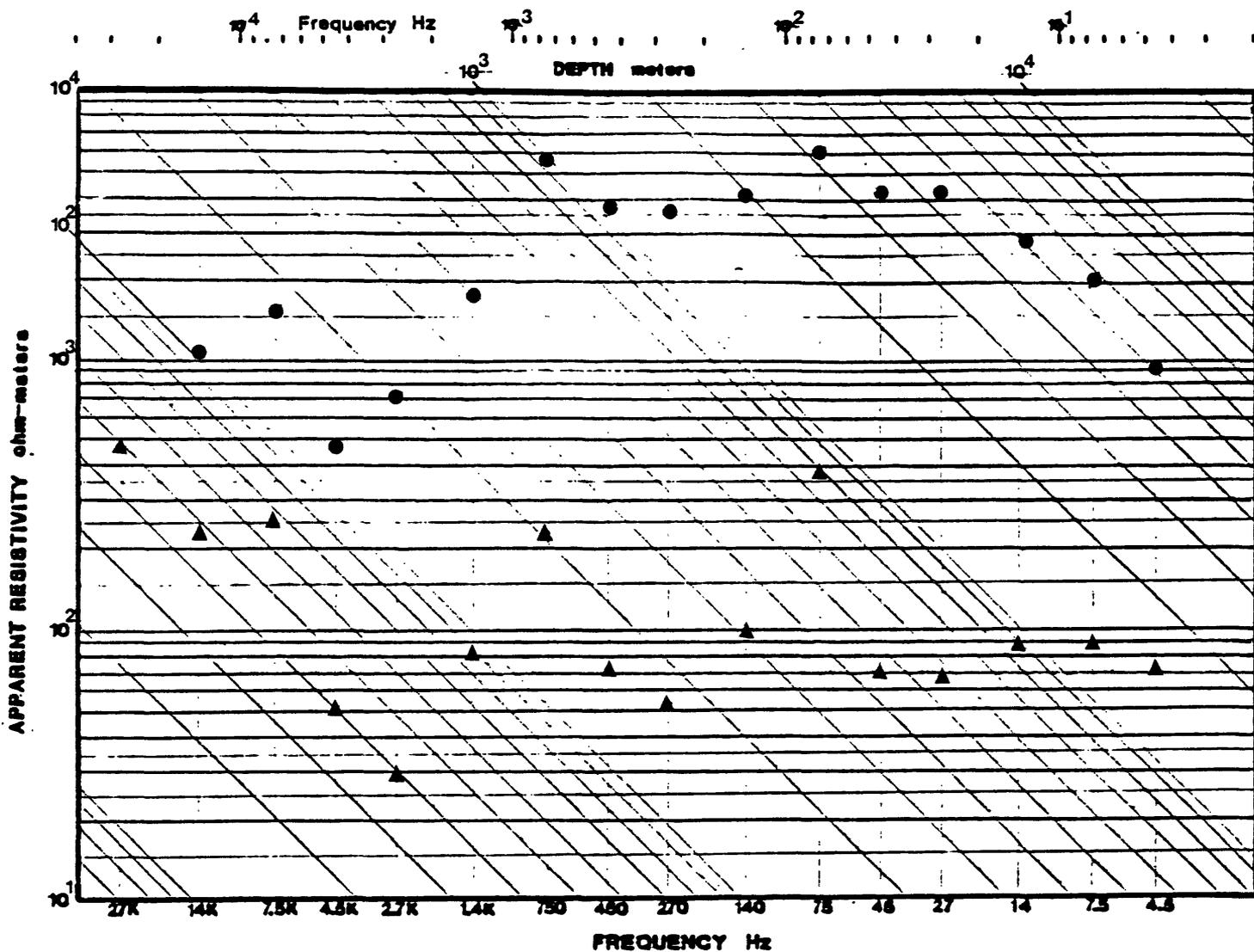
Location 10 Lakes, MT Station 16 Date 8-29-82 Operators DBH, DM^{SN}



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	Pg	No.	Error	Pg	No.	Error		
4.5	855	1	185	589	3	155	4.5	
7.5	609	8	59	1333	8	287	7.5	
14	1956	8	326	569	10	62	14	
27	2909	7	309	743	7	102	27	
45	3015	10	242	1195	10	89	45	
75	4938	10	250	932	11	87	75	
140	4039	10	380	1026	10	129	140	
270	2669	10	310	1167	10	96	270	
450	1773	10	268	1346	10	103	450	
750	1691	10	213	997	8	32	750	
1.4K	1817	2	209	680	7	89	1.4K	
2.7K	874	2	272	148	3	61	2.7K	
4.5K	774	6	82	216	9	31	4.5K	
7.5K	1918	5	382	137	10	19	7.5K	
14K	4862	4	667	161	6	13	14K	
27K	2731	5	350	428	7	52	27K	

USGS Scalar AEMT Data Log

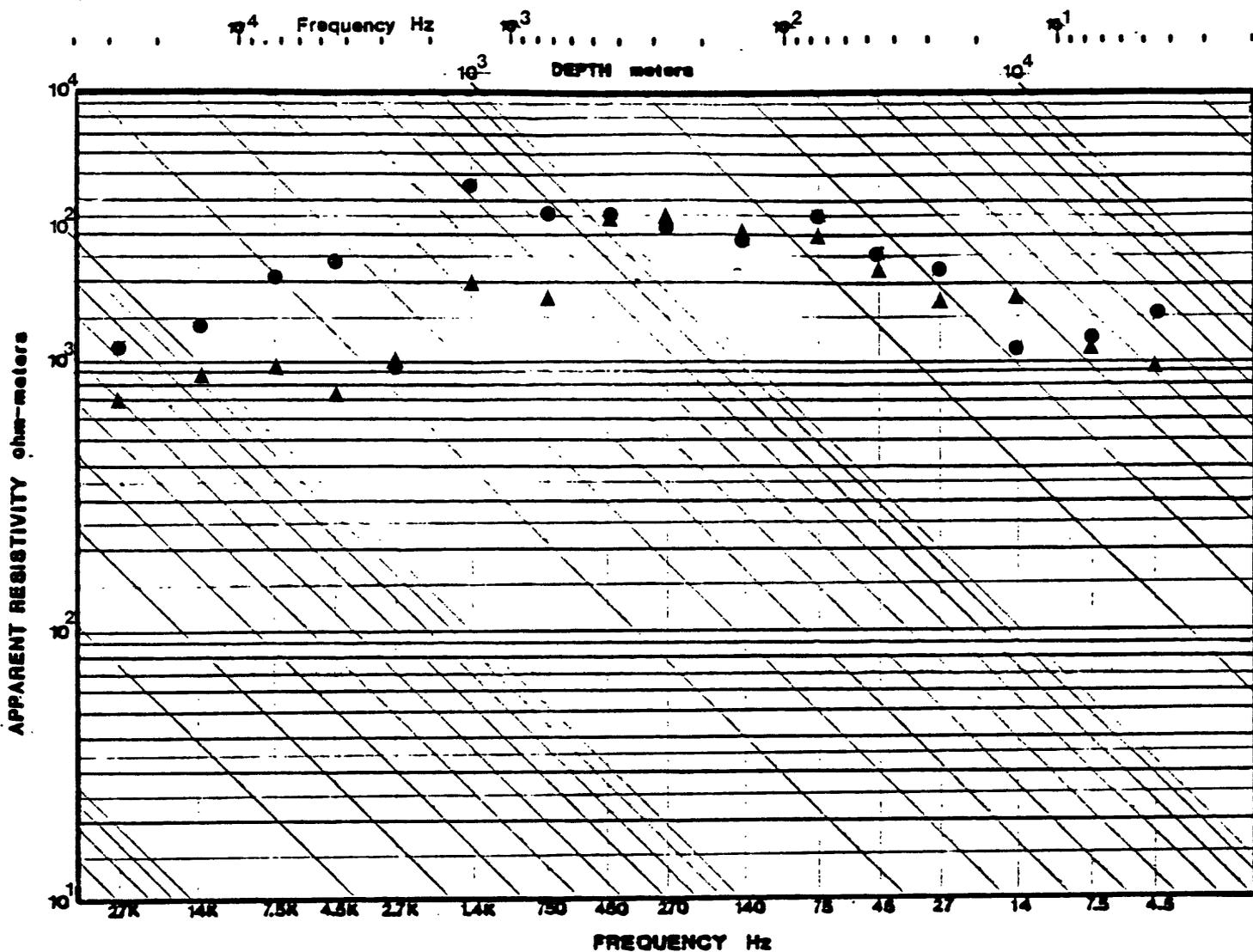
Location 10 Lakes, MT Station 17 Date 8-29-82 Operators DBH, DMSN



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	P _a	N _a	Error	P _a	N _a	Error		
4.5	922	6	94	72	5	12		4.5
7.5	2033	9	155	87	8	17		7.5
14	2743	8	181	86	7	13		14
27	4330	9	294	67	4	10		27
46	4367	11	216	71	6	6		46
75	6102	11	491	383	8	69		75
140	4120	5	386	97	10	12		140
270	3517	13	107	53	10	7		270
460	3763	5	554	73	9	9		460
750	5771	7	402	228	5	44		750
1.4K	1782	5	222	81	5	13		1.4K
2.7K	719	3	277	79	2	11		2.7K
4.5K	472	4	83	51	12	5		4.5K
7.5K	1530	12	64	252	9	64		7.5K
14K	1106	10	49	230	5	11		14K
27K	-	-	-	460	4	34		27K

USGS Scaler ALT Data Log

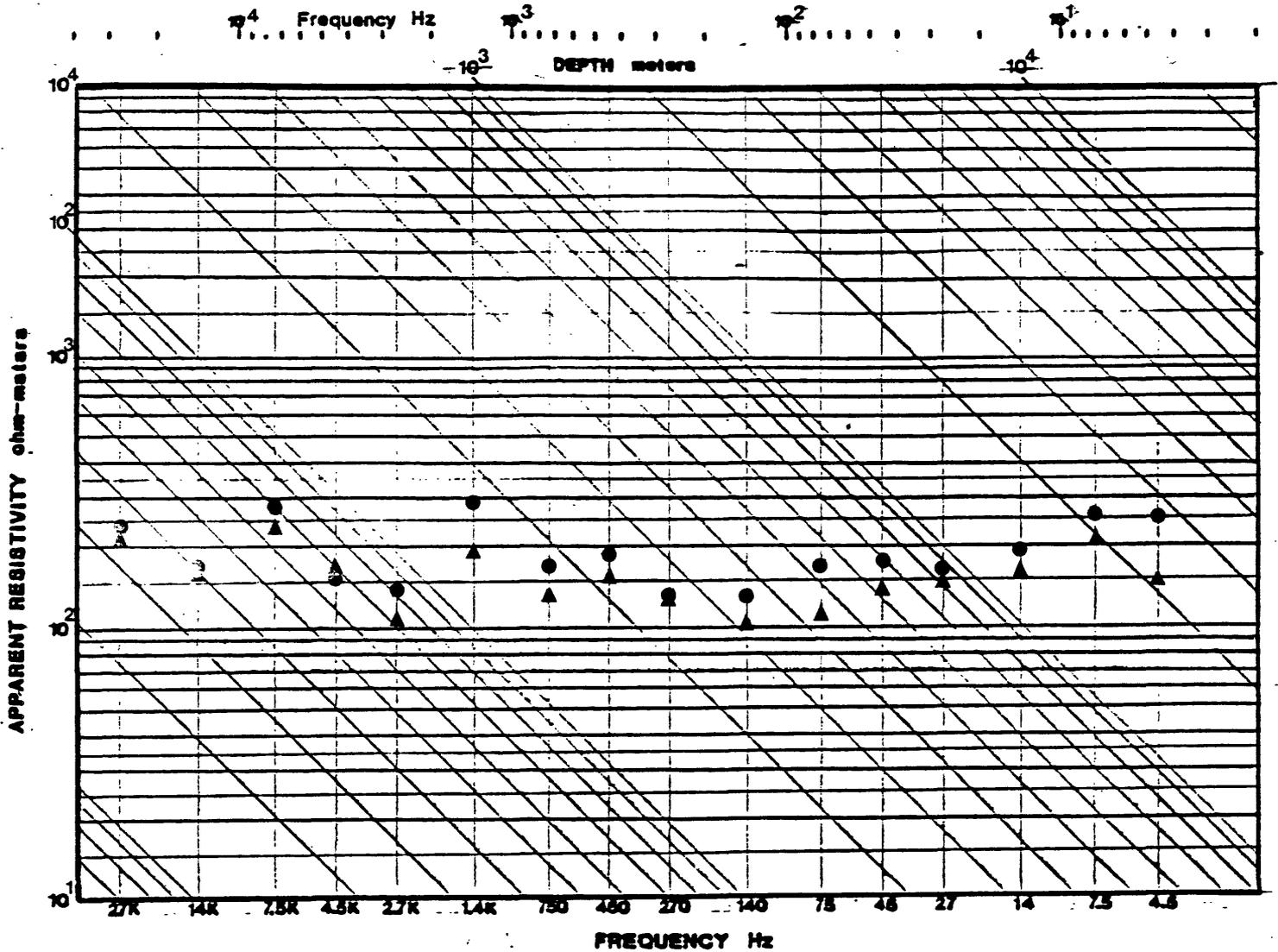
Location 10 Lakes, MT Station 18 Date 8-29-81 Operators DBH, DM^cN



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Pa	Ma	Error	Pa	Ma	Error		
4.5	1520	9	136	952	10	127		4.5
7.5	1286	8	102	1182	8	53		7.5
14	1726	7	112	1864	12	77		14
27	2227	10	141	1749	10	55		27
46	2671	7	178	2407	10	163		46
75	3430	7	280	2931	10	240		75
140	2923	10	189	3128	8	240		140
270	3141	8	275	3412	10	221		270
460	3609	7	220	3430	6	212		460
750	3635	9	346	1745	11	164		750
1.4K	4587	5	1056	1970	6	196		1.4 K
2.7K	903	2	35	438	6	116		2.7 K
4.5K	2303	9	50	713	4	57		4.5 K
7.5K	2146	9	181	924	4	12		7.5 K
14K	1441	5	90	858	3	38		14 K
27K	1227	8	77	697	6	32		27 K

USGS Scaler AMT Data Log

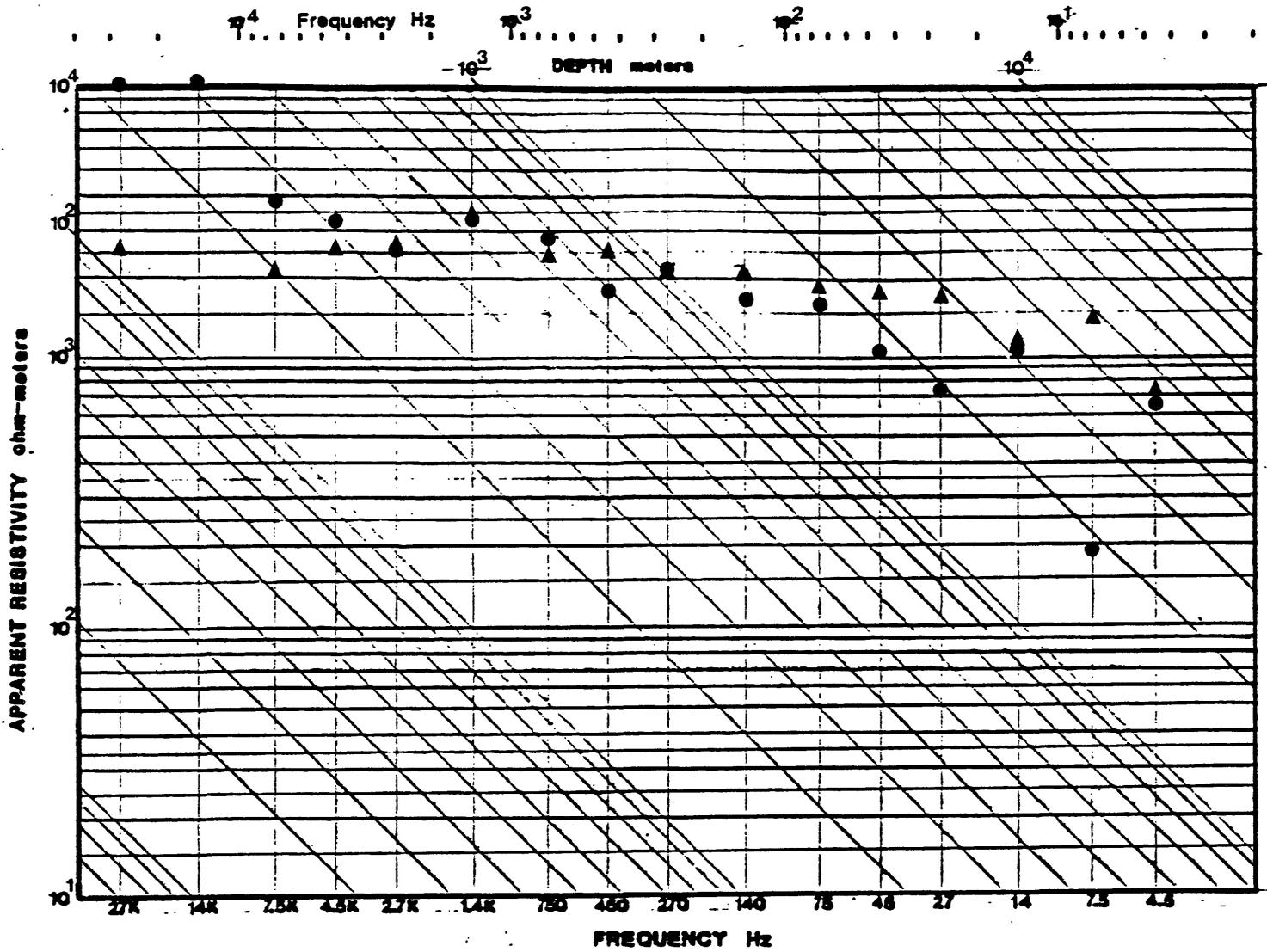
Location 10 Lakes, MT Station 19 Date 8-29-81 Operators DBH, DM^cN



E-line orientation -- N/S ●				E-line orientation -- E/W ▲			Remarks	Freq. Hz
Freq. Hz	P _a	N _a	Error	P _a	N _a	Error		
4.5	251	8	23	147	10	12	4.5	
7.5	258	10	16	217	10	6	7.5	
14	192	11	7	169	11	9	14	
27	166	8	8	147	9	5	27	
45	179	10	4	139	12	6	45	
75	173	13	6	117	16	5	75	
140	135	13	5	108	13	5	140	
270	140	15	3	137	16	4	270	
450	189	11	7	154	11	5	450	
750	171	10	5	137	6	2	750	
1.4K	293	12	9	186	11	7	1.4K	
2.7K	145	13	7	116	11	5	2.7K	
4.5K	157	11	4	170	12	6	4.5K	
7.5K	281	8	35	237	5	33	7.5K	
14K	174	9	10	164	7	5	14K	
27K	242	6	17	204	5	28	27K	

USGS Scaler AMT Data Log

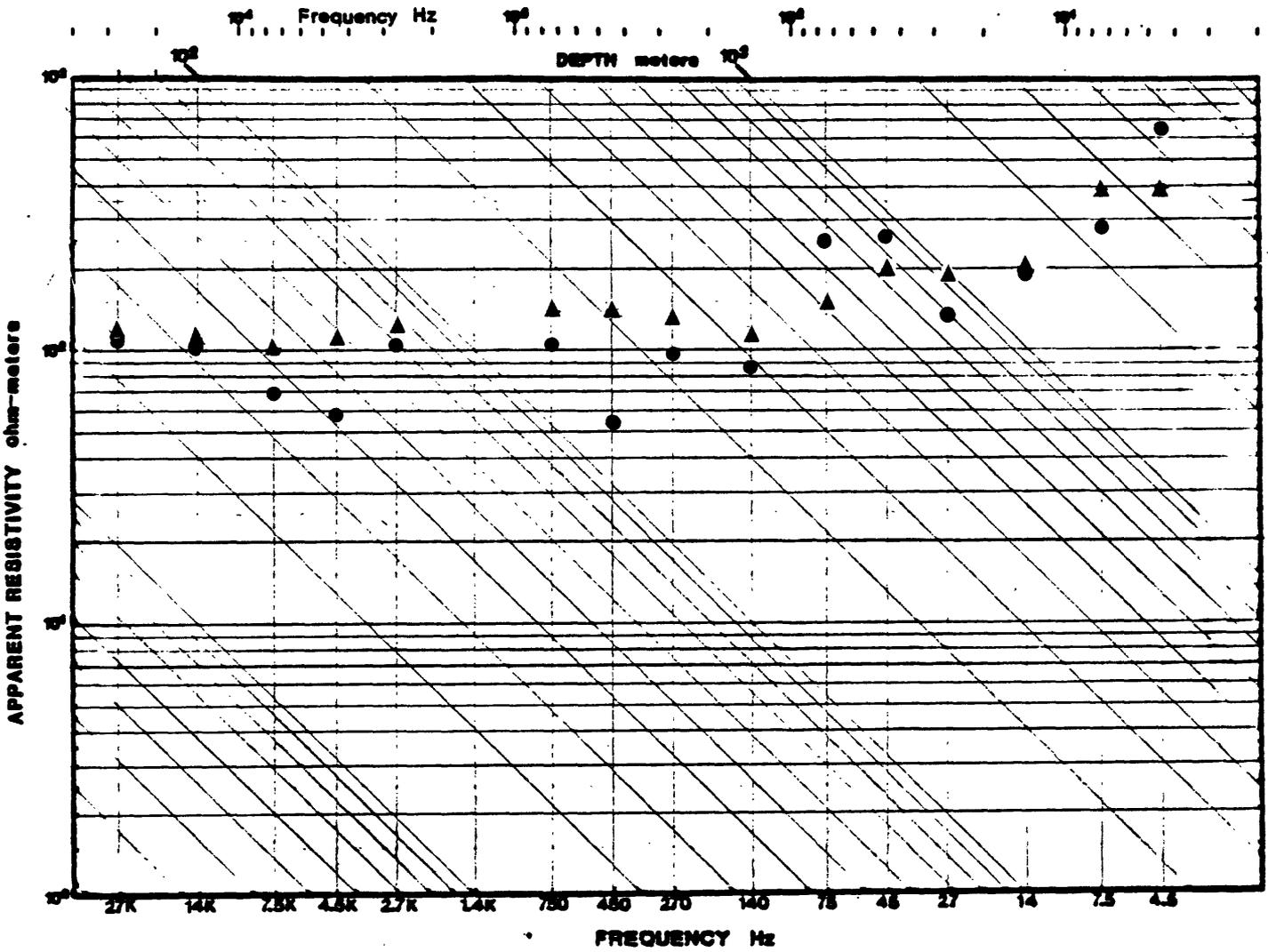
Location 10 Lakes, MT Station 20 Date 9-29-81 Operator DBH, DAIN



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	P _a	No.	Error	P _a	No.	Error		
4.5	634	5	49	707	5	116	4.5	
7.5	793	9	14	1459	12	151	7.5	
14	1062	7	128	1213	10	57	14	
27	742	7	87	1733	11	86	27	
46	1023	7	60	1839	9	52	46	
75	1558	9	186	1847	11	97	75	
140	1683	7	81	2164	11	161	140	
270	2182	12	255	2086	11	81	270	
460	1842	12	116	2516	10	122	460	
750	2793	9	335	2345	11	42	750	
1.4K	3197	9	365	3447	12	225	1.4K	
2.7K	2559	11	169	2767	8	125	2.7K	
4.5K	3258	12	176	2615	10	104	4.5K	
7.5K	3855	9	234	2136	7	107	7.5K	
14K	10445	7	1049	-	-	-	14K	
27K	10592	3	2058	2587	6	87	27K	

USGS Scaler A&T Data Log

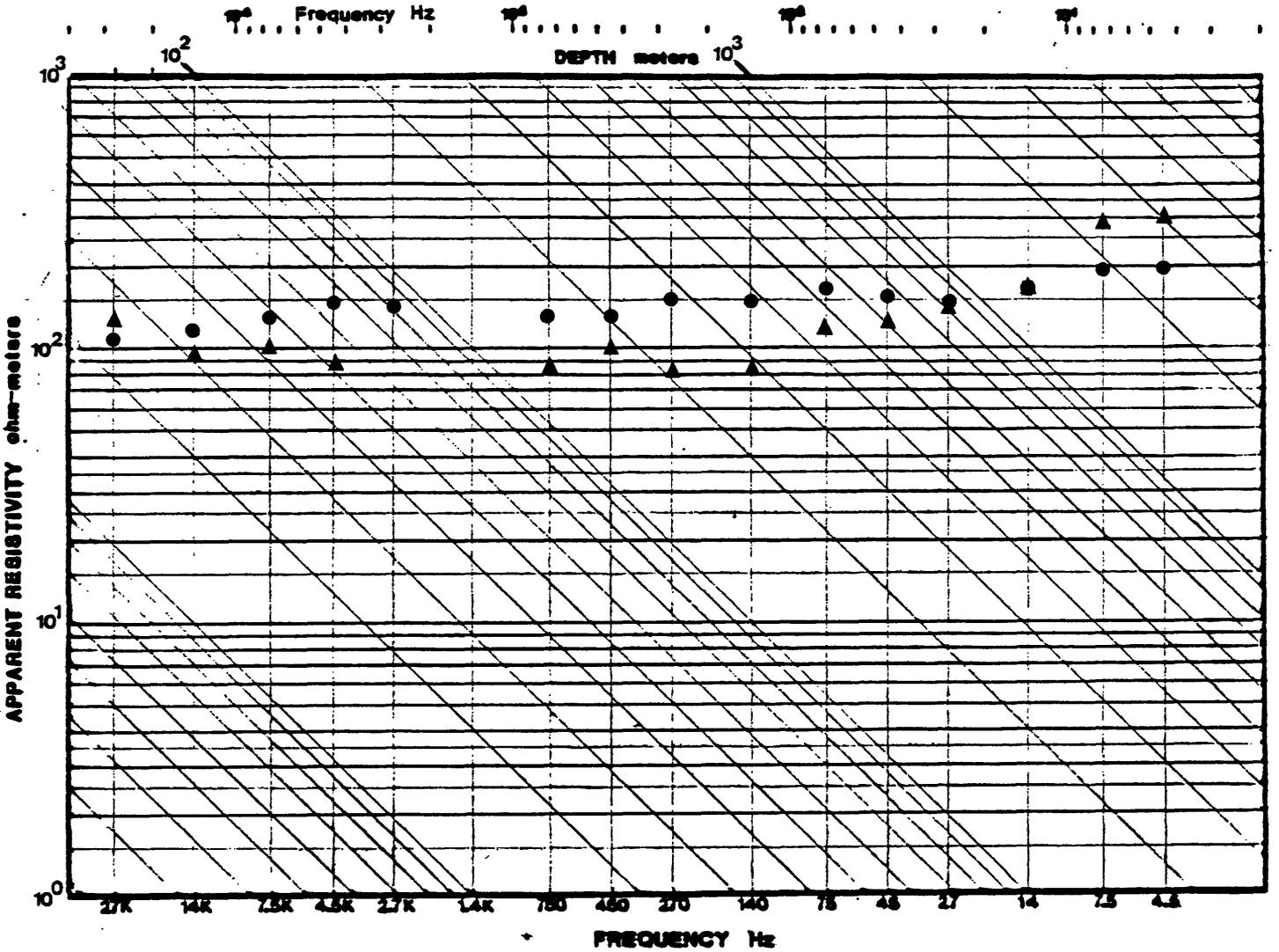
Location 10 Lakes MT Station Z1 Date 8-3-82 Operator DBH MB



Freq. Hz	E-Naz orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Pg	Na	Error	Pg	Na	Error		
4.5	656	11	75.5	376	5	17.0		4.5
7.5	285	10	11.5	373	9	17.1		7.5
14	193	10	8.89	199	8	8.80		14
27	133	10	7.59	190	10	19.7		27
45	253	11	14.6	192	9	7.65		45
75	231	4	27.4	144	10	7.34		75
140	87.3	10	4.91	116	10	5.66		140
270	96.6	9	4.79	127	10	10.8		270
450	53.0	6	4.97	137	10	6.44		450
750	106	2	18.0	136	7	11.0		750
1.4K	—	—	—	—	—	—		1.4K
2.7K	107	6	8.01	127	7	4.33		2.7K
4.5K	58.5	9	3.87	110	10	6.19		4.5K
7.5K	69.2	10	6.25	102	10	6.84		7.5K
14K	107	5	7.12	111	5	2.03		14K
27K	109	3	1.32	112	1	0.00		27K

USGS Scaler AMT Data Log

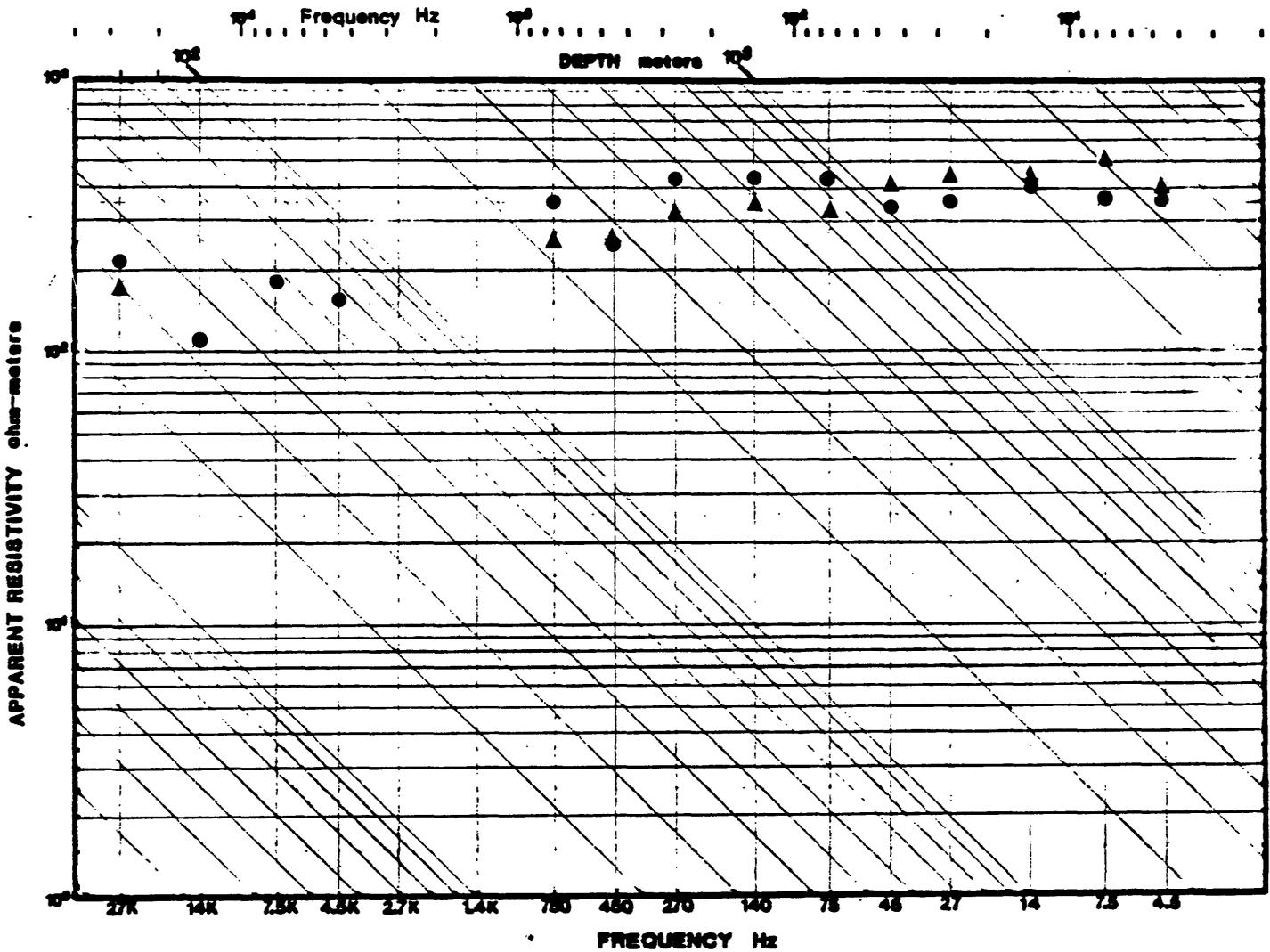
Location 10 Lakes, MT Station 22 Date 8-3-82 Operators DBH, MB



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks
Freq. Hz	P _a	N _a	Error	P _a	N _a	Error	
4.5	196	10	21.2	311	11	33.0	4.5
7.5	191	10	12.7	287	10	16.0	7.5
14	172	11	14.4	167	10	5.22	14
27	148	10	4.53	142	10	6.77	27
45	151	10	10.5	127	10	9.73	45
75	165	12	10.5	119	10	12.7	75
140	149	10	15.2	85.5	10	6.44	140
270	151	7	9.97	84.0	8	3.71	270
450	133	3	14.2	101	10	10.3	450
750	135	2	62.3	84.8	6	3.66	750
1.4K	-	-	-	-	-	-	1.4K
2.7K	145	2	11.5	-	-	-	2.7K
4.5K	140	3	25.2	87.5	8	5.41	4.5K
7.5K	133	8	5.94	105	9	6.38	7.5K
14K	121	5	7.96	96.0	5	8.21	14K
27K	113	5	9.06	130	3	3.34	27K

USGS Scalar AEM Data Log

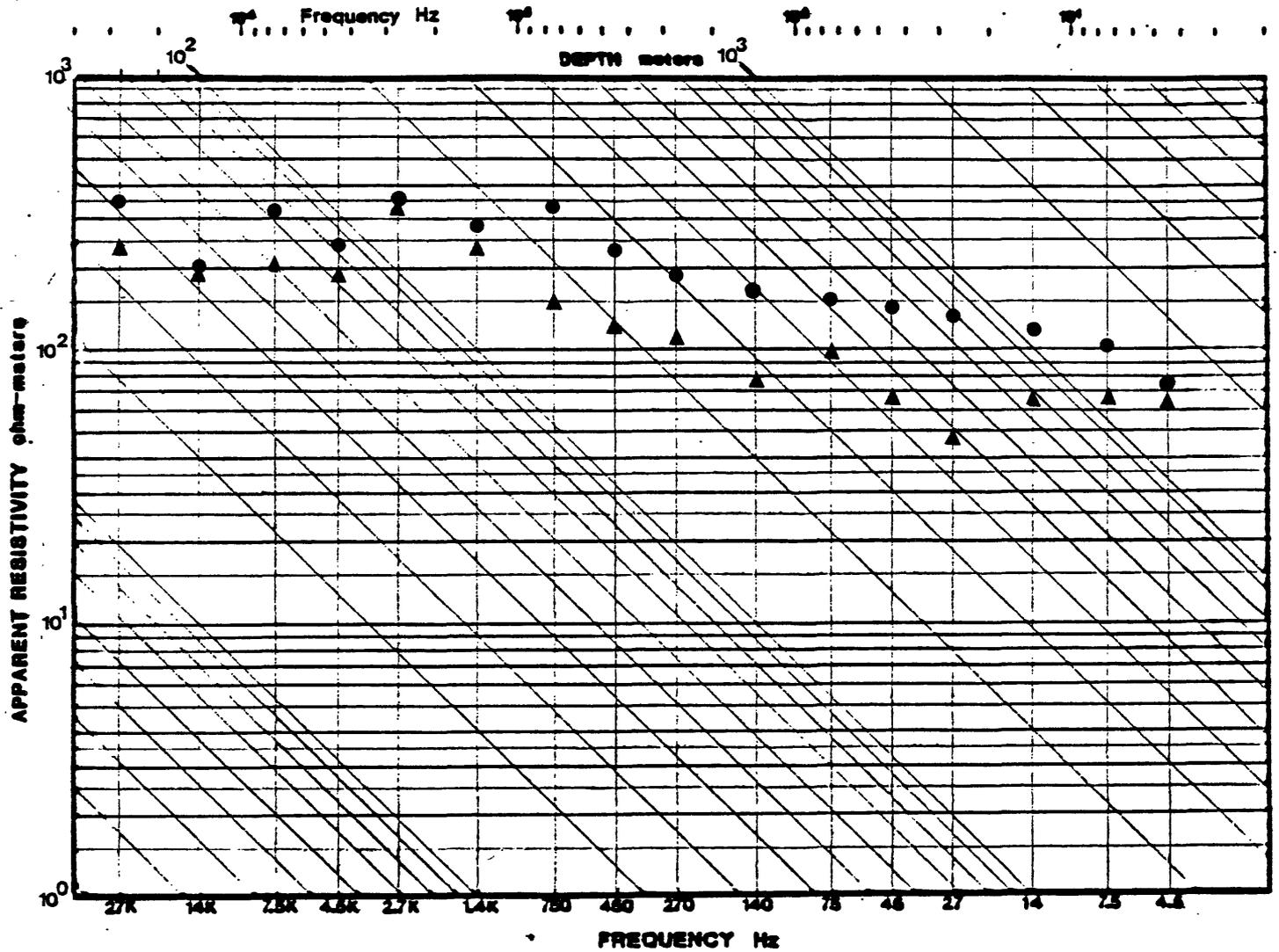
Location 10 Lakes MT Station 23 Date 8-3-82 Operator DBH MB



E-line orientation -- N/S ●				E-line orientation -- E/W ▲			Remarks	Freq. Hz
Freq. Hz	P ₀	No.	Error	P ₀	No.	Error		
4.5	355	6	43.5	402	9	20.5	4.5	
7.5	355	10	14.7	509	10	22.6	7.5	
14	403	10	20.0	431	10	9.84	14	
27	352	10	17.9	456	11	16.5	27	
46	338	10	13.9	409	10	11.8	46	
75	438	11	21.4	331	10	11.6	75	
140	426	10	34.2	355	11	17.5	140	
270	428	10	32.0	315	10	16.0	270	
480	292	7	29.7	257	10	21.6	480	
750	351	9	20.9	256	10	11.3	750	
1.4K	—	—	—	—	—	—	1.4K	
2.7K	—	—	—	—	—	—	2.7K	
4.5K	151	6	4.17	—	—	—	4.5K	
7.5K	186	10	6.23	—	—	—	7.5K	
14K	116	5	14.5	—	—	—	14K	
27K	217	5	11.0	175	2	3.51	27K	

USGS Scaler AMT Data Log

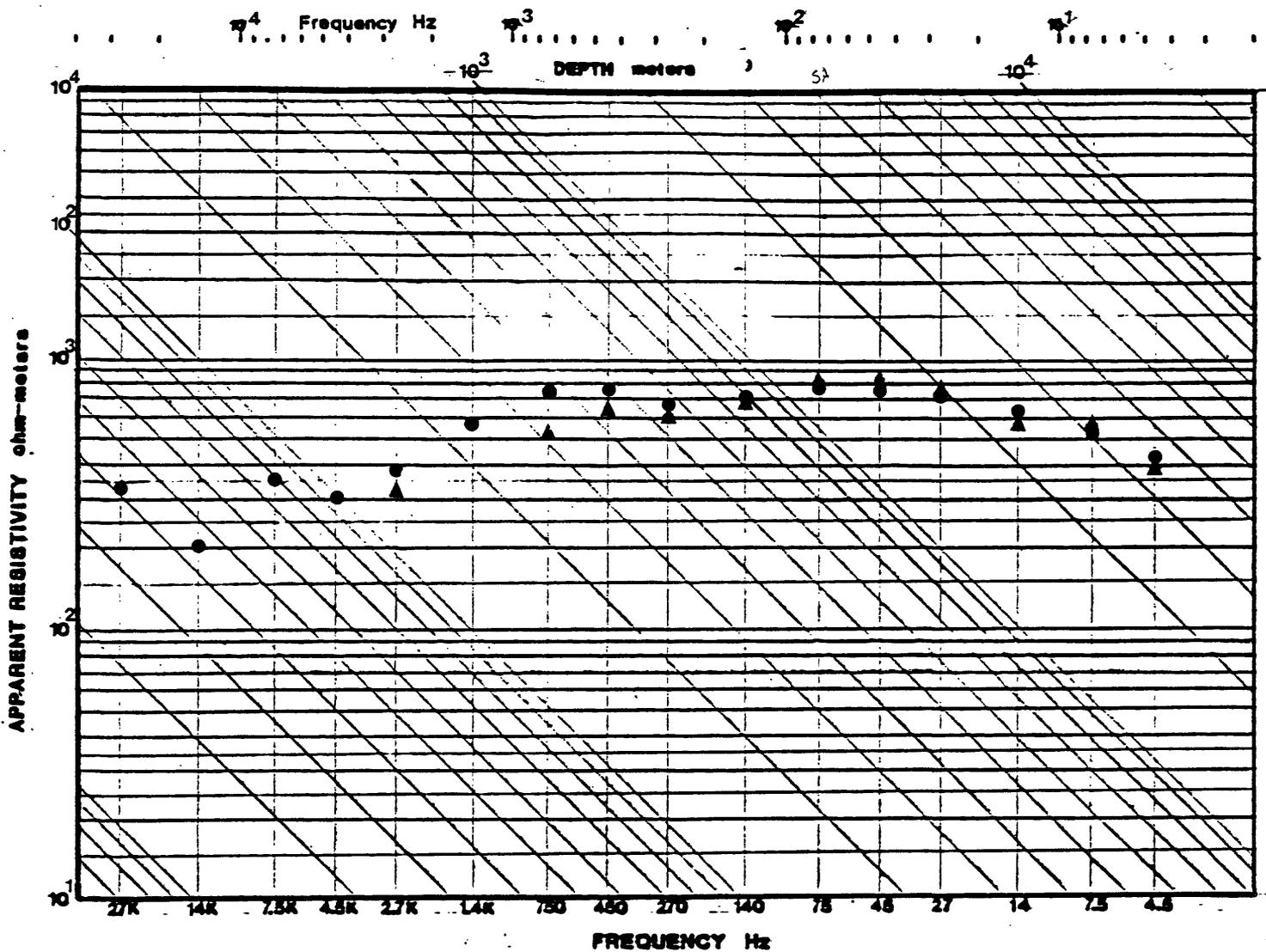
Location 10 Lakes, MT Station 24 Date 8-3-82 Operator DBH, MB



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	P _a	N _a	Error	P _a	N _a	Error		
4.5	76.0	9	4.50	64.0	7	6.38		4.5
7.5	108	10	5.10	65.9	10	8.02		7.5
14	122	10	3.94	62.1	9	3.93		14
27	134	10	3.20	48.8	10	4.76		27
46	144	10	7.37	66.2	10	9.30		46
75	154	9	10.4	97.1	9	10.7		75
140	170	10	5.80	75.6	10	7.14		140
270	187	10	5.74	115	12	12.8		270
460	236	10	10.3	123	9	11.6		460
750	332	10	9.13	149	7	12.2		750
1.4K	288	10	24.8	239	4	27.8		1.4K
2.7K	358	7	53.2	314	9	32.5		2.7K
4.5K	296	9	12.5	191	10	22.0		4.5K
7.5K	324	9	8.03	208	8	6.54		7.5K
14K	203	5	15.3	181	5	6.91		14K
27K	352	5	13.0	231	4	5.11		27K

USGS Scaler AMT Data Log

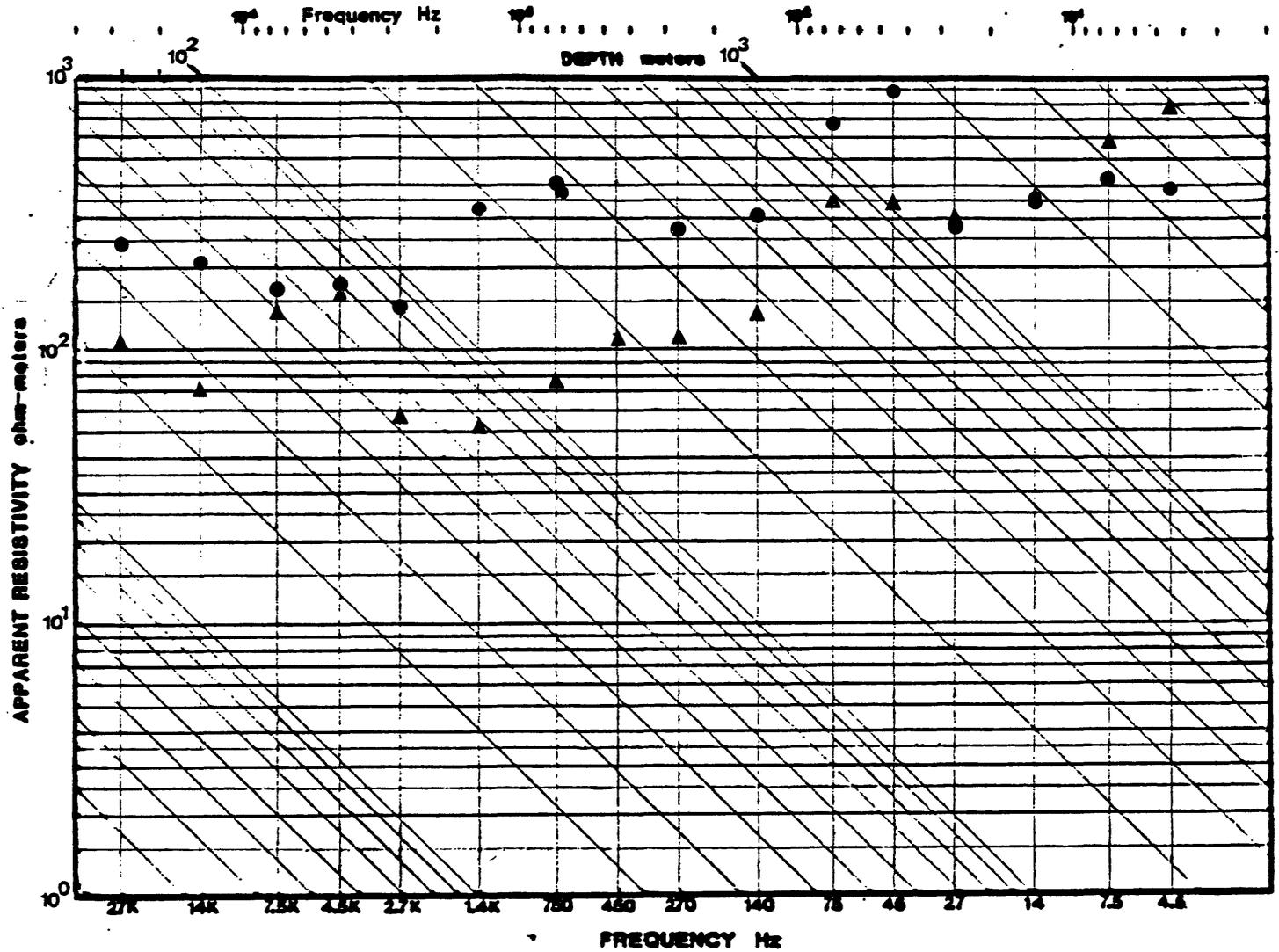
Location 10 Lakes MT Station 25 Date 8-3-82 Operator DBH MB



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Pa	Ma	Error	Pa	Ma	Error		
4.5	428	6	59.6	372	9	21.2		4.5
7.5	521	11	35.8	587	10	24.0		7.5
14	628	9	43.4	554	9	23.7		14
27	712	10	16.2	752	10	17.4		27
48	767	10	33.6	802	10	27.7		48
75	762	10	18.9	780	10	41.9		75
140	705	9	24.4	665	10	38.7		140
270	675	10	19.0	592	10	41.4		270
480	757	9	32.7	632	10	24.8		480
750	750	9	33.9	527	10	29.2		750
1.4K	571	8	60.4	-	-	-		1.4K
2.7K	381	7	24.4	332	5	32.3		2.7K
4.5K	308	9	17.6	-	-	-		4.5K
7.5K	367	9	13.8	-	-	-		7.5K
14K	202	10	8.44	-	-	-		14K
27K	337	3	14.6	-	-	-		27K

USGS Scalar AMT Data Log

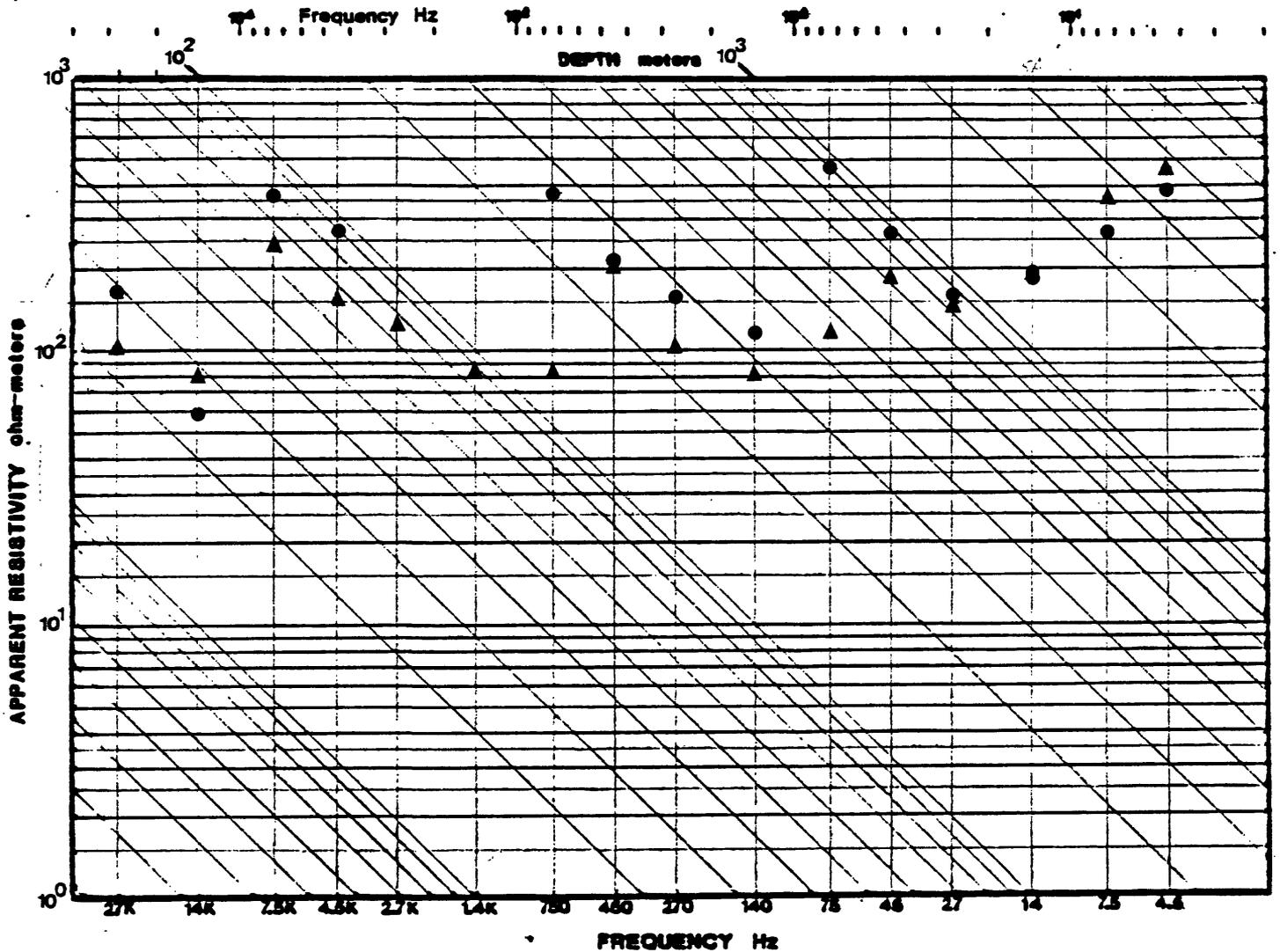
Location 10 Lakes Station 26 Date 8-4-82 Operators DBH, MB



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Pa	Ma	Error	Pa	Ma	Error		
4.5	386	7	43.5	782	10	120		4.5
7.5	429	11	44.6	588	5	57.8		7.5
14	343	10	20.7	357	10	22.8		14
27	273	10	16.0	287	10	18.4		27
45	889	5	119	342	11	26.4		45
75	681	10	44.7	343	8	41.6		75
140	317	8	24.8	136	10	5.46		140
270	280	10	13.7	113	10	4.66		270
450	409	5	34.1	110	10	6.72		450
750	416	7	29.0	76.9	5	3.14		750
1.4K	329	9	7.85	52.6	2	7.31		1.4K
2.7K	142	1	0.00	56.2	3	13.2		2.7K
4.5K	180	10	11.6	156	9	13.1		4.5K
7.5K	167	10	12.0	135	7	5.77		7.5K
14K	209	8	11.5	71.2	8	1.69		14K
27K	246	8	11.5	109	2	179		27K

USGS Scaler AMT Data Log

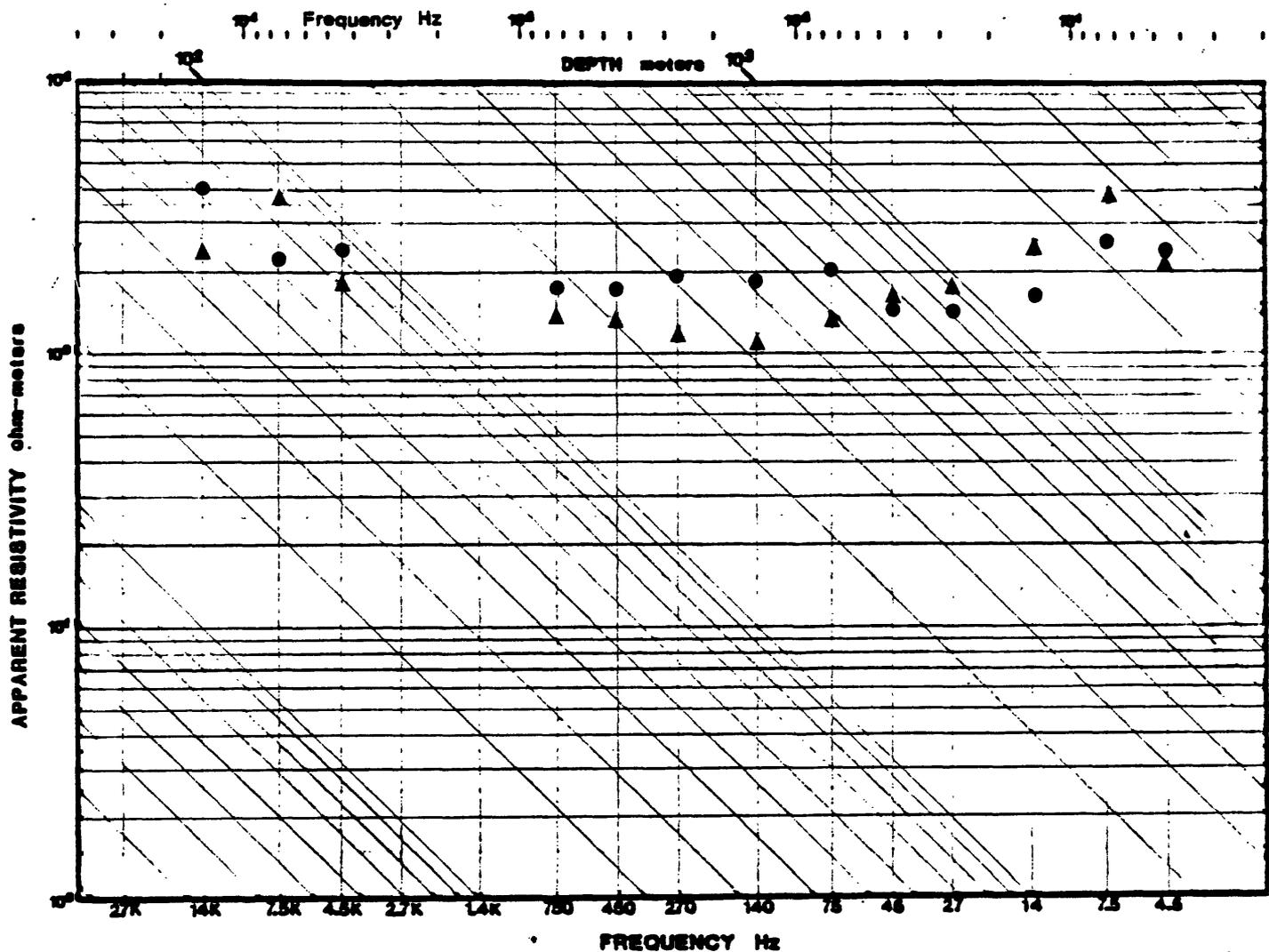
Location 10 Lakes, MT Station 27 Date 8-4-82 Operator DBH, MB



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	P ₀	N ₀	Error	P ₀	N ₀	Error		
4.5	381	9	46.6	469	7	54.5	4.5	
7.5	267	10	23.3	364	9	24.0	7.5	
14	187	10	10.8	191	10	9.08	14	
27	163	10	20.7	147	10	6.57	27	
45	267	7	58.0	187	5	21.4	45	
75	439	4	157	120	10	12.5	75	
140	122	10	4.89	81.9	10	6.26	140	
270	159	11	14.4	105	10	7.31	270	
450	219	6	29.9	205	5	16.4	450	
750	372	3	147	85.2	5	10.6	750	
1.4K	—	—	—	85.6	1	—	1.4K	
2.7K	—	—	—	128	1	—	2.7K	
4.5K	277	8	36.6	158	4	4.12	4.5K	
7.5K	365	4	45.9	242	8	25.0	7.5K	
14K	590	6	189	81.4	5	3.10	14K	
27K	165	5	13.8	101	2	10.3	27K	

USGS Scaler AMT Data Log

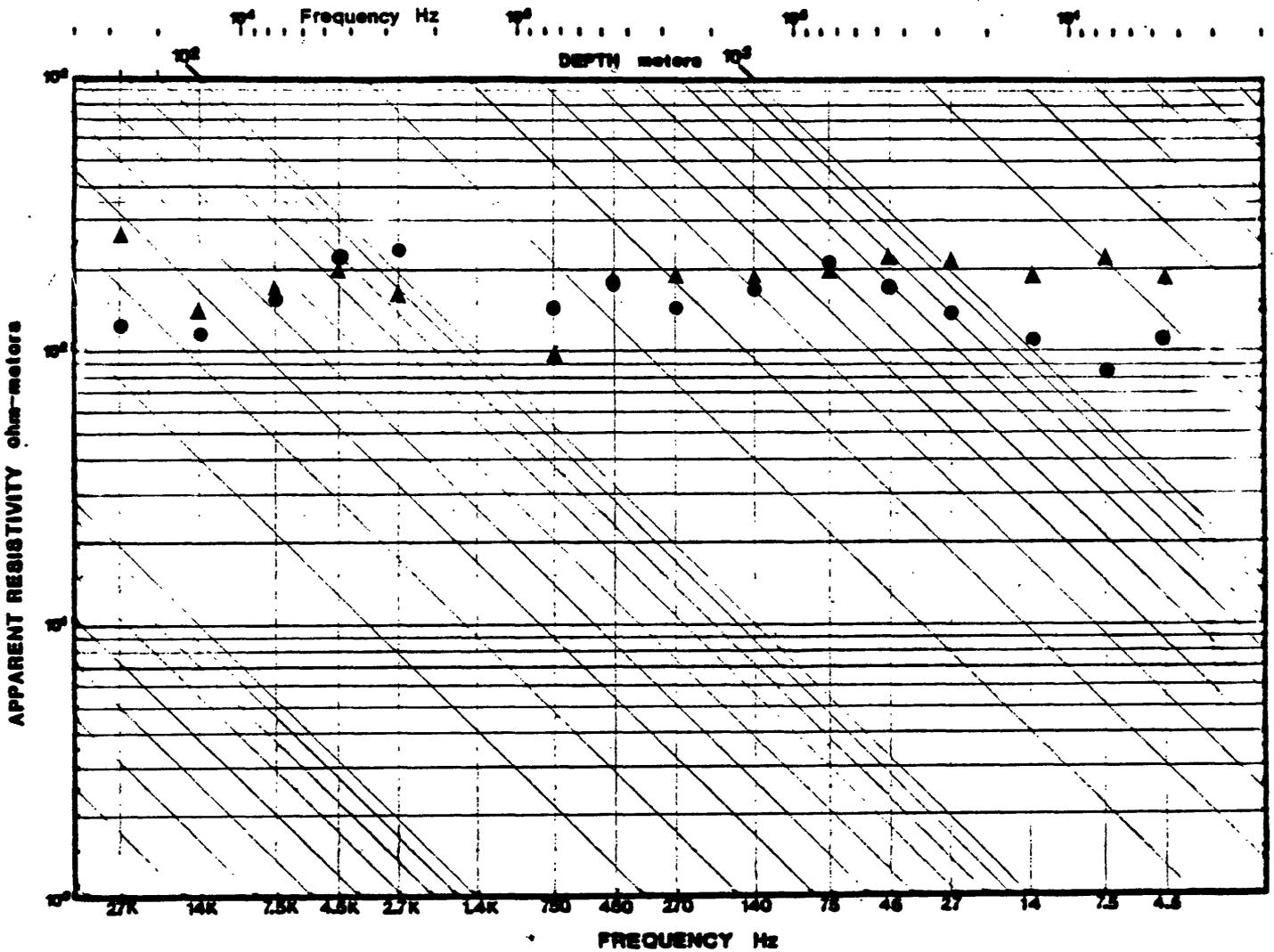
Location 10 Lakes Station 28 Date 8-4-82 Operators DBH, MB



E-line orientation -- N/S ●				E-line orientation -- E/W ▲			Remarks	Freq. Hz
Freq. Hz	Pa	Na	Error	Pa	Na	Error		
4.5	237	9	29.1	213	5	25.0	4.5	
7.5	251	9	29.2	381	9	19.5	7.5	
14	155	9	8.97	242	10	17.7	14	
27	143	10	8.56	178	10	8.77	27	
45	145	11	12.5	168	10	8.78	45	
75	205	10	9.94	135	10	8.95	75	
140	185	10	8.72	113	10	5.72	140	
270	194	10	7.30	120	10	4.35	270	
450	174	11	20.7	135	10	17.1	450	
750	176	7	20.7	139	10	37.5	750	
1.4K	-	-	-	-	-	-	1.4 K	
2.7K	-	-	-	-	-	-	2.7 K	
4.5K	246	4	31.1	189	5	6.36	4.5 K	
7.5K	223	10	20.9	375	10	27.6	7.5 K	
14K	404	6	38.4	244	5	7.10	14 K	
27K	-	-	-	-	-	-	27 K	

USGS Scaler AEMT Data Log

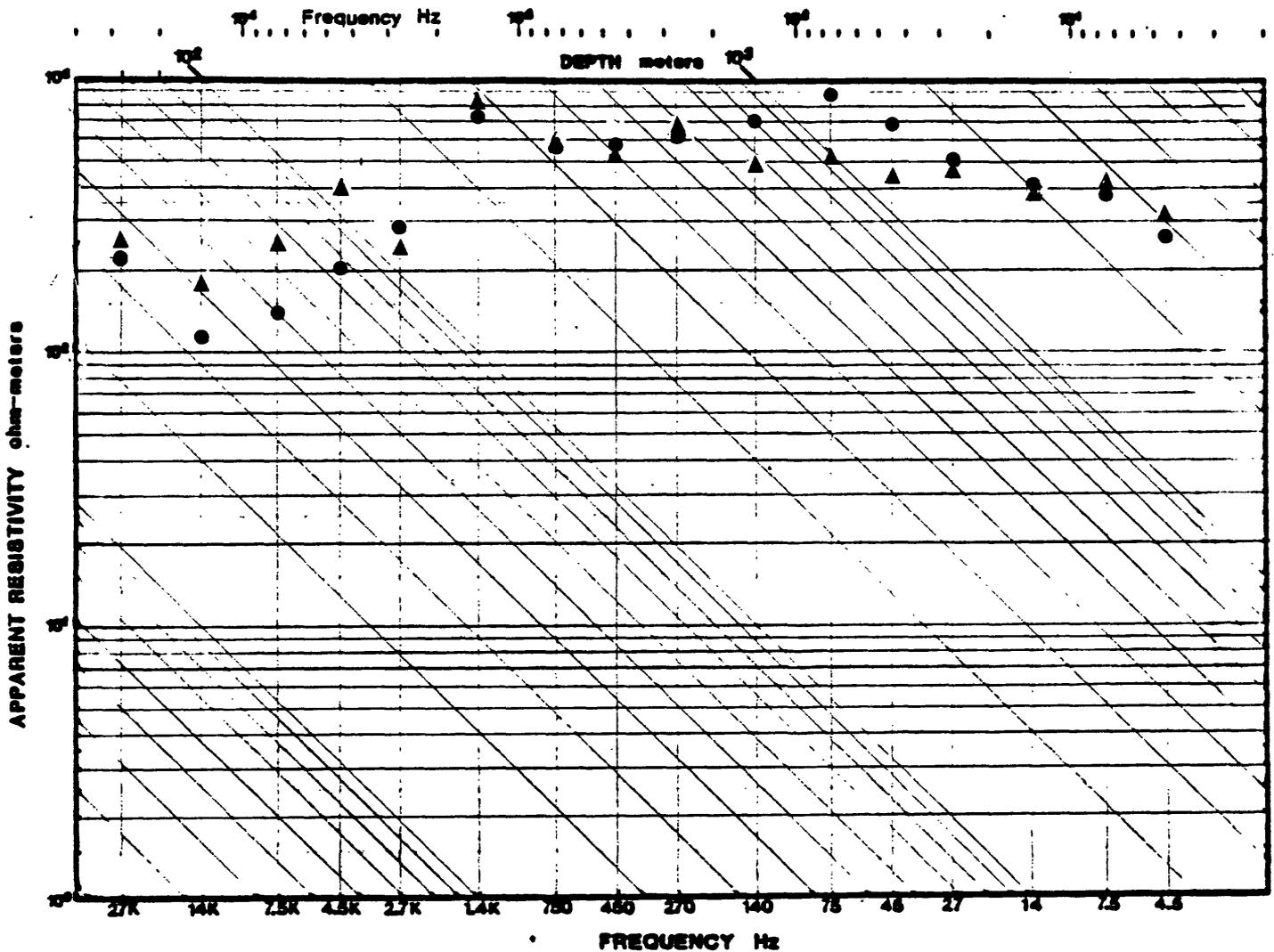
Location 10 Lakes, MT Station 29 Date 8-4-82 Operator DBH, MB



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	P _g	N _a	Error	P _g	N _a	Error		
4.5	111	7	14.5	185	10	25.8	4.5	
7.5	94.0	9	8.32	218	10	11.6	7.5	
14	112	7	9.06	192	10	9.29	14	
27	138	10	7.78	210	10	6.16	27	
45	164	10	8.10	220	10	10.9	45	
75	209	7	23.7	204	10	7.02	75	
140	168	9	18.4	186	10	8.24	140	
270	143	10	6.10	189	10	8.18	270	
450	178	10	9.18	180	10	5.12	450	
750	146	10	8.73	94.1	9	12.7	750	
1.4K	-	-	-	-	-	-	1.4K	
2.7K	233	3	97.0	154	5	12.8	2.7K	
4.5K	223	10	12.6	200	11	13.3	4.5K	
7.5K	155	10	4.05	163	9	9.87	7.5K	
14K	117	5	4.26	144	5	3.31	14K	
27K	123	5	4.47	261	2	3.31	27K	

USGS Sealer A&T Data Log

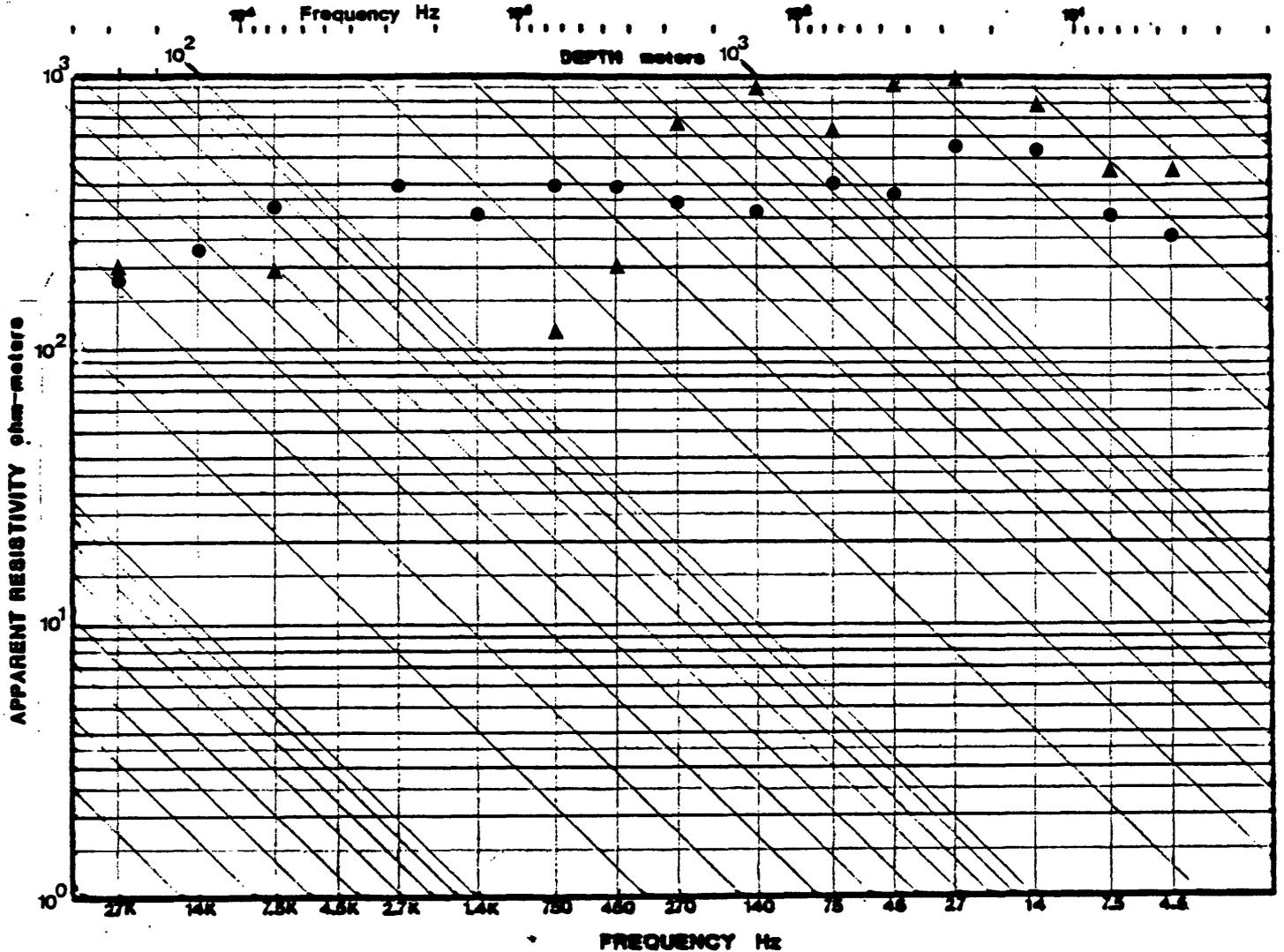
Location 10 Lakes, MT Station 30 Date 8-4-82 Operator DBH, MB



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Po	Na	Error	Po	Na	Error		
4.5	254	10	23.9	312	10	16.5		4.5
7.5	354	10	14.9	408	10	28.8		7.5
14	410	10	10.0	393	10	23.0		14
27	491	10	14.2	465	10	18.9		27
45	669	10	30.3	492	10	23.3		45
75	743	10	25.8	519	9	31.5		75
140	690	10	27.9	498	10	34.6		140
270	606	10	19.7	628	10	28.5		270
450	568	10	27.9	706	10	25.0		450
750	535	10	21.0	594	8	22.2		750
1.4K	708	6	81.7	836	7	17.2		1.4 K
2.7K	783	3	19.4	299	8	5.57		2.7 K
4.5K	205	10	8.92	392	10	31.0		4.5 K
7.5K	192	10	2.62	244	9	15.2		7.5 K
14K	111	5	5.65	189	5	5.97		14 K
27K	218	5	5.11	252	4	7.32		27 K

USGS Scaler AMT Data Log

Location 10 Lake MT Station 31 Date 8-5-82 Operator DBH, MB



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	P ₀	N _a	Error	P ₀	N _a	Error		
4.5	256	3	52.9	421	2	33.8		4.5
7.5	315	10	19.4	448	7	66.4		7.5
14	534	8	39.0	760	10	45.0		14
27	552	10	37.9	452	10	124		27
45	363	10	33.7	416	10	31.5		45
75	405	10	33.4	636	10	56.3		75
140	321	9	19.4	893	7	83.5		140
270	393	5	22.4	657	5	222		270
450	394	5	54.7	191	3	72.0		450
750	393	6	15.3	113	1	-		750
1.4K	311	5	9.02	-	-	-		1.4K
2.7K	395	4	20.9	-	-	-		2.7K
4.5K	-	-	-	-	-	-		4.5K
7.5K	331	9	24.8	189	8	20.4		7.5K
14K	230	5	10.5	-	-	-		14K
27K	182	5	35.3	198	5	11.3		27K

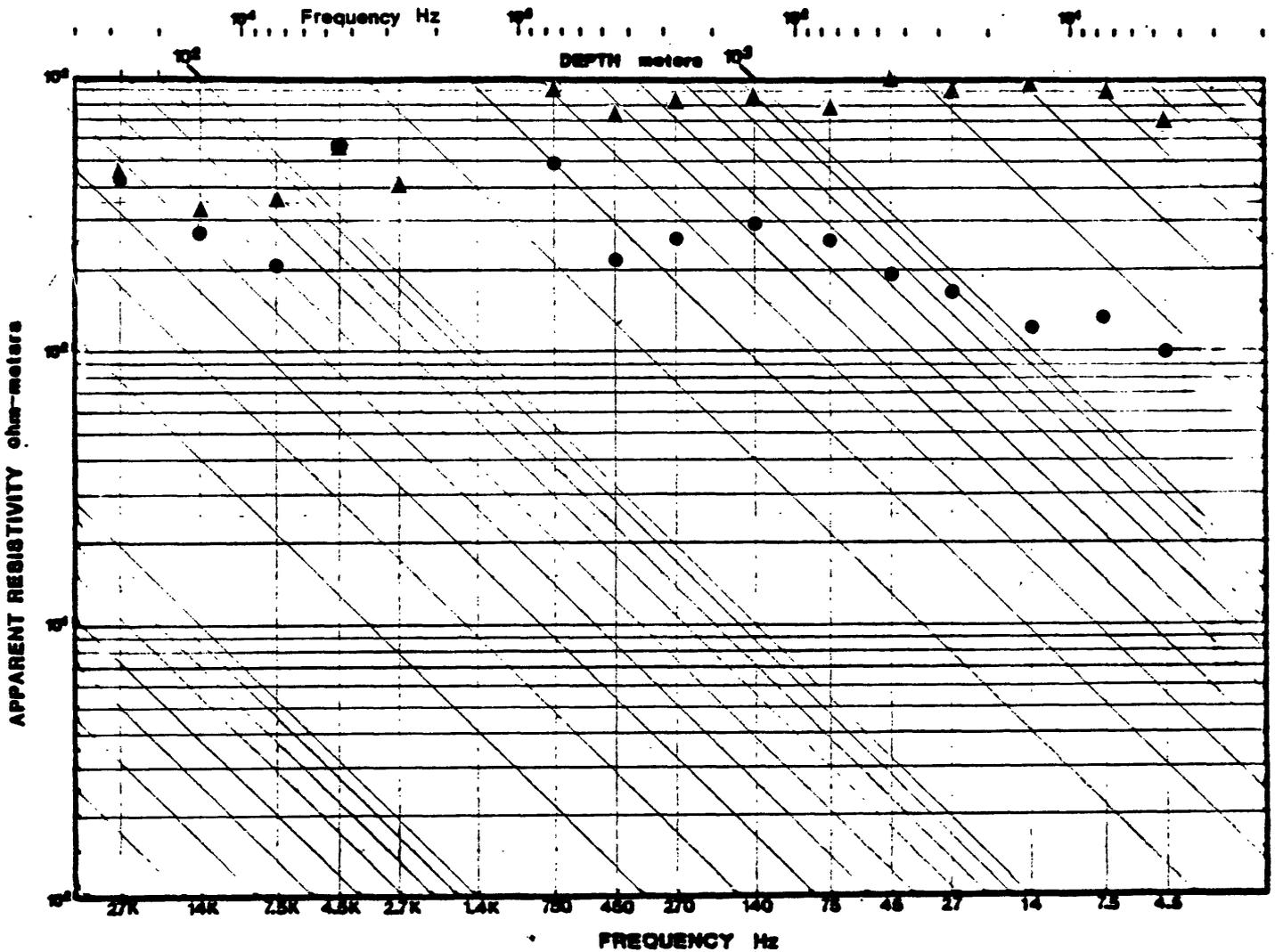
USGS Sealer AMT Data Log

Location 10 Lakes

Station 32

Date 8-5-82

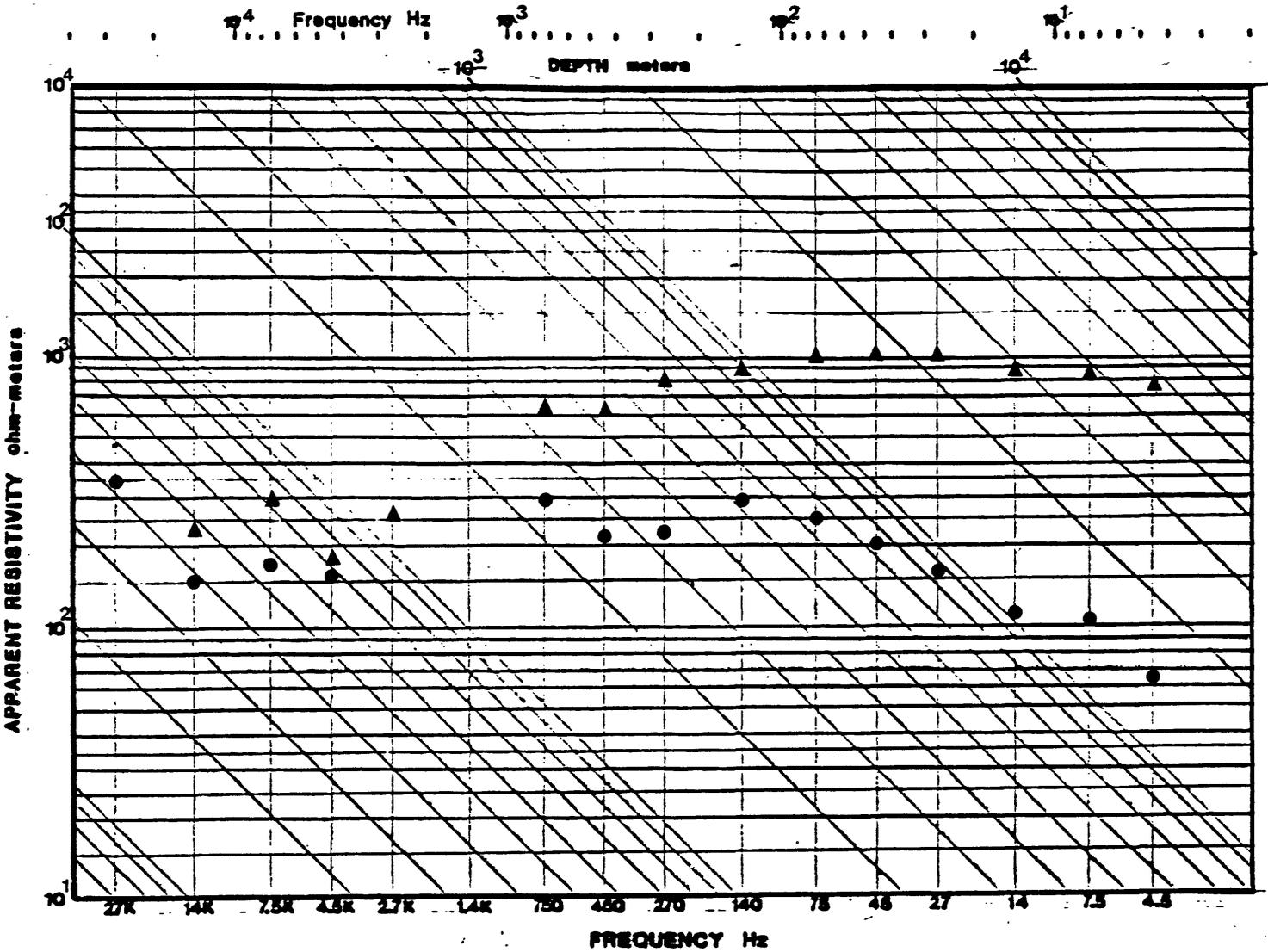
Operator DBH, MB



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	
Freq. Hz	P _a	M _a	Error	P _a	M _a	Error		Freq. Hz
4.5	96.7	5	10.8	694	12	80.6		4.5
7.5	139	9	9.23	901	8	33.4		7.5
14	127	10	7.65	949	10	48.0		14
27	159	10	4.67	913	10	35.6		27
45	188	14	16.1	1021	10	41.4		45
75	257	10	16.3	789	10	49.0		75
140	293	15	25.1	855	11	40.9		140
270	256	8	20.1	831	10	35.3		270
450	216	4	81.1	751	8	132		450
750	493	1	-	910	10	117		750
1.4K	-	-	-	-	-	-		1.4K
2.7K	-	-	-	411	2	68.6		2.7K
4.5K	576	7	30.0	563	9	49.5		4.5K
7.5K	206	10	7.05	352	10	14.2		7.5K
14K	266	5	11.9	330	5	12.2		14K
27K	410	5	21.7	455	5	12.8		27K

USGS Scaler A&T Data Log

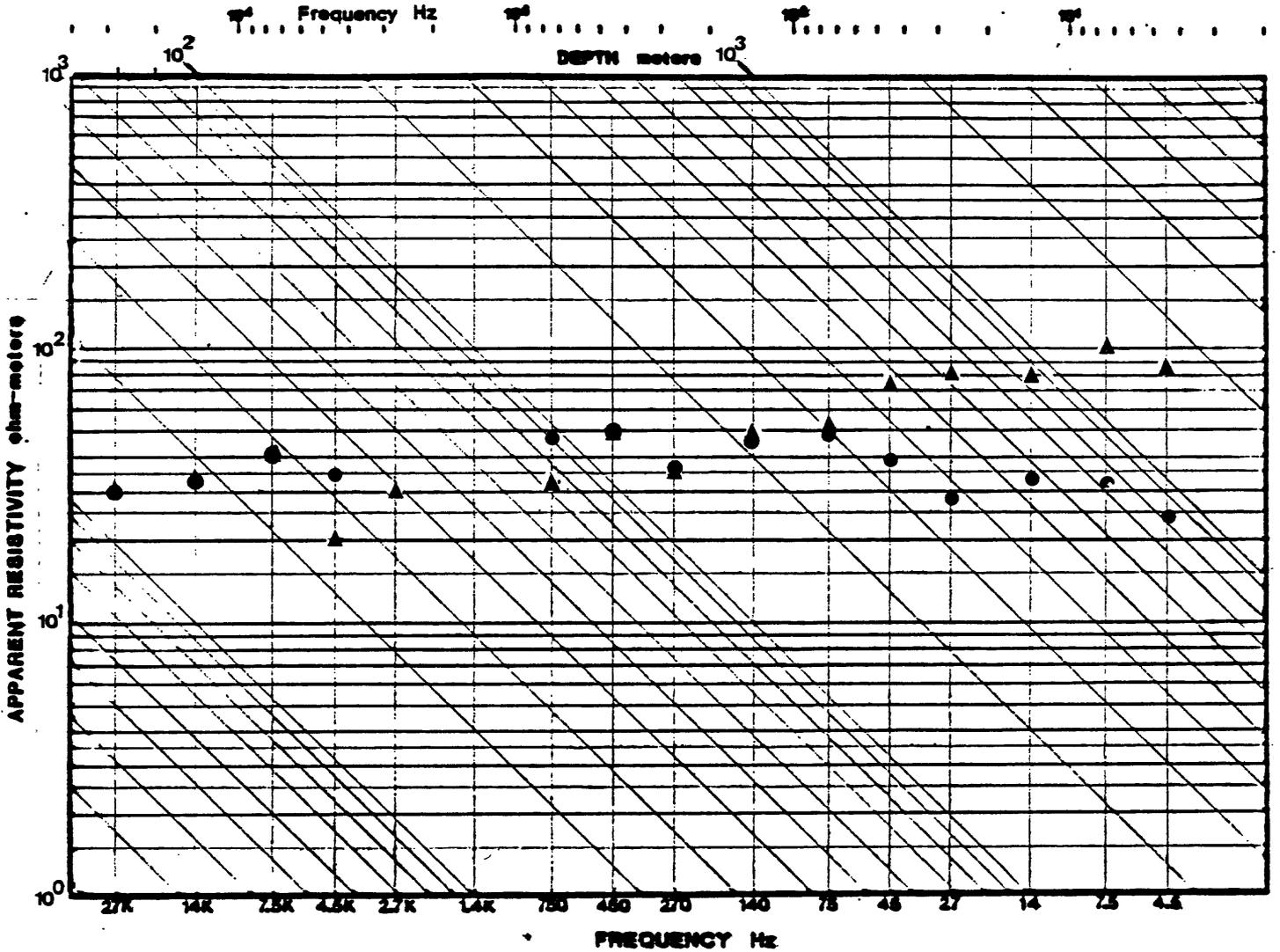
Location 10 Lakes, MT Station 33 Date 8-5-82 Operators DBH, MJB



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Pa	Na	Error	Pa	Na	Error		
4.5	65.8	11	4.53	791	7	58.0		4.5
7.5	112	10	8.78	891	10	45.8		7.5
14	118	10	7.89	865	10	24.2		14
27	161	10	3.13	1033	10	76.5		27
48	201	9	13.6	1086	10	57.0		48
75	252	10	12.0	1006	10	45.5		75
140	297	10	16.5	886	10	47.7		140
270	226	10	14.9	801	10	43.7		270
450	218	10	31.4	642	11	37.6		450
750	293	7	31.7	647	10	49.6		750
1.4K	-	-	-	-	-	-		1.4K
2.7K	-	-	-	263	3	34.1		2.7K
4.5K	158	10	4.58	184	10	18.1		4.5K
7.5K	173	10	3.29	295	10	13.4		7.5K
14K	151	6	7.07	240	5	51.4		14K
27K	341	6	6.81	465	5	16.1		27K

USGS Scaler AMT Data Log

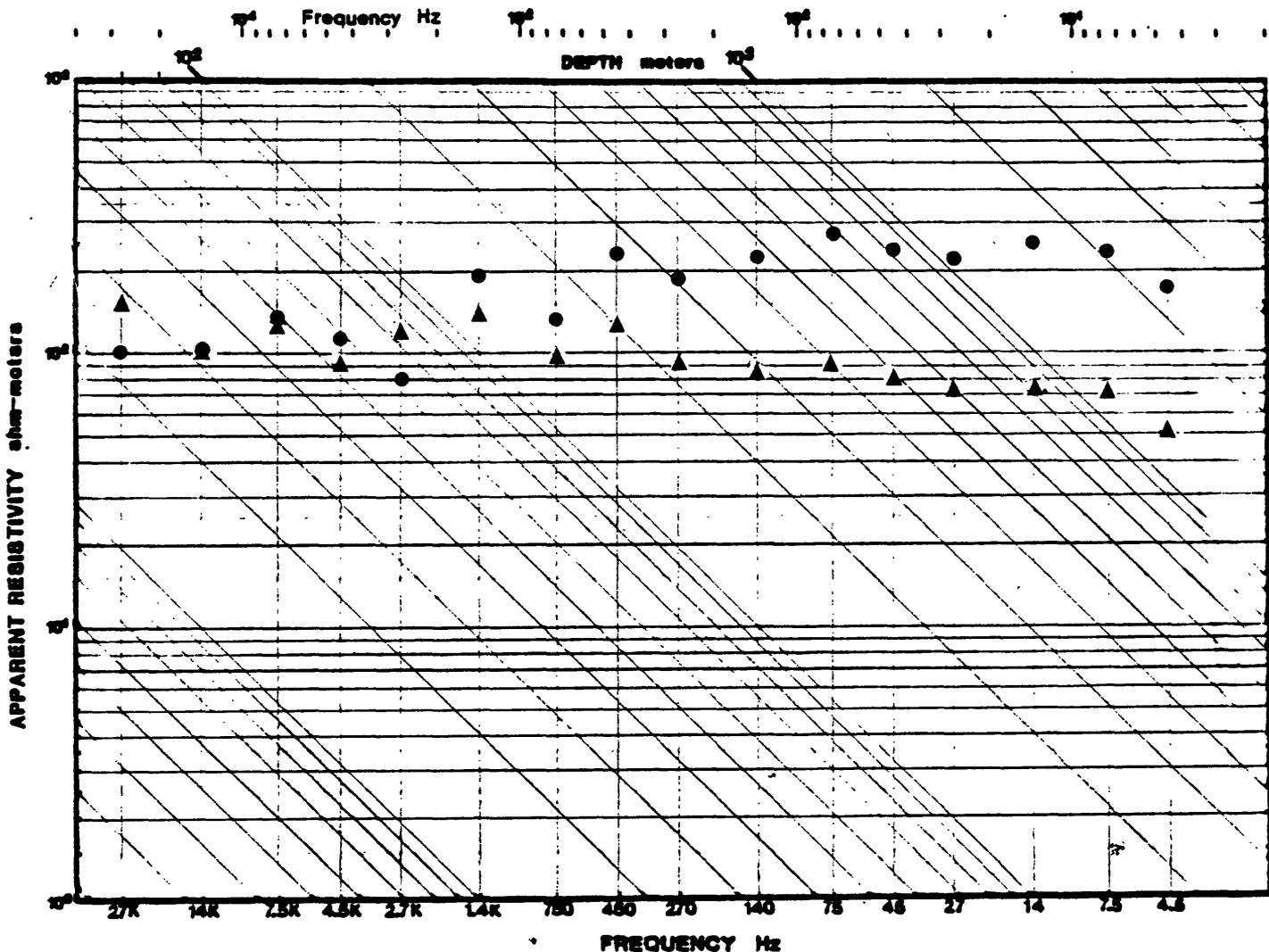
Location 10 Lakes MT Station 34 Date 8-5-82 Operator DBH MB



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Po	Na	Error	Po	Na	Error		
4.5	229	10	22.5	855	10	93.3		4.5
7.5	313	10	21.7	1025	10	70.1		7.5
14	328	10	13.9	796	10	39.1		14
27	290	10	13.6	804	10	25.0		27
45	389	10	31.7	748	9	25.9		45
75	470	10	22.2	531	10	27.9		75
140	454	7	15.1	489	11	39.3		140
270	436	10	12.6	367	10	11.4		270
450	503	10	29.8	490	10	30.2		450
750	472	10	28.8	325	9	16.9		750
1.4K	-	-	-	-	-	-		1.4K
2.7K	-	-	-	304	2	3.67		2.7K
4.5K	397	10	7.83	208	10	8.23		4.5K
7.5K	433	10	15.0	413	10	30.6		7.5K
14K	333	10	13.9	335	5	6.84		14K
27K	302	6	17.0	307	5	15.4		27K

USGS Scalar AMT Data Log

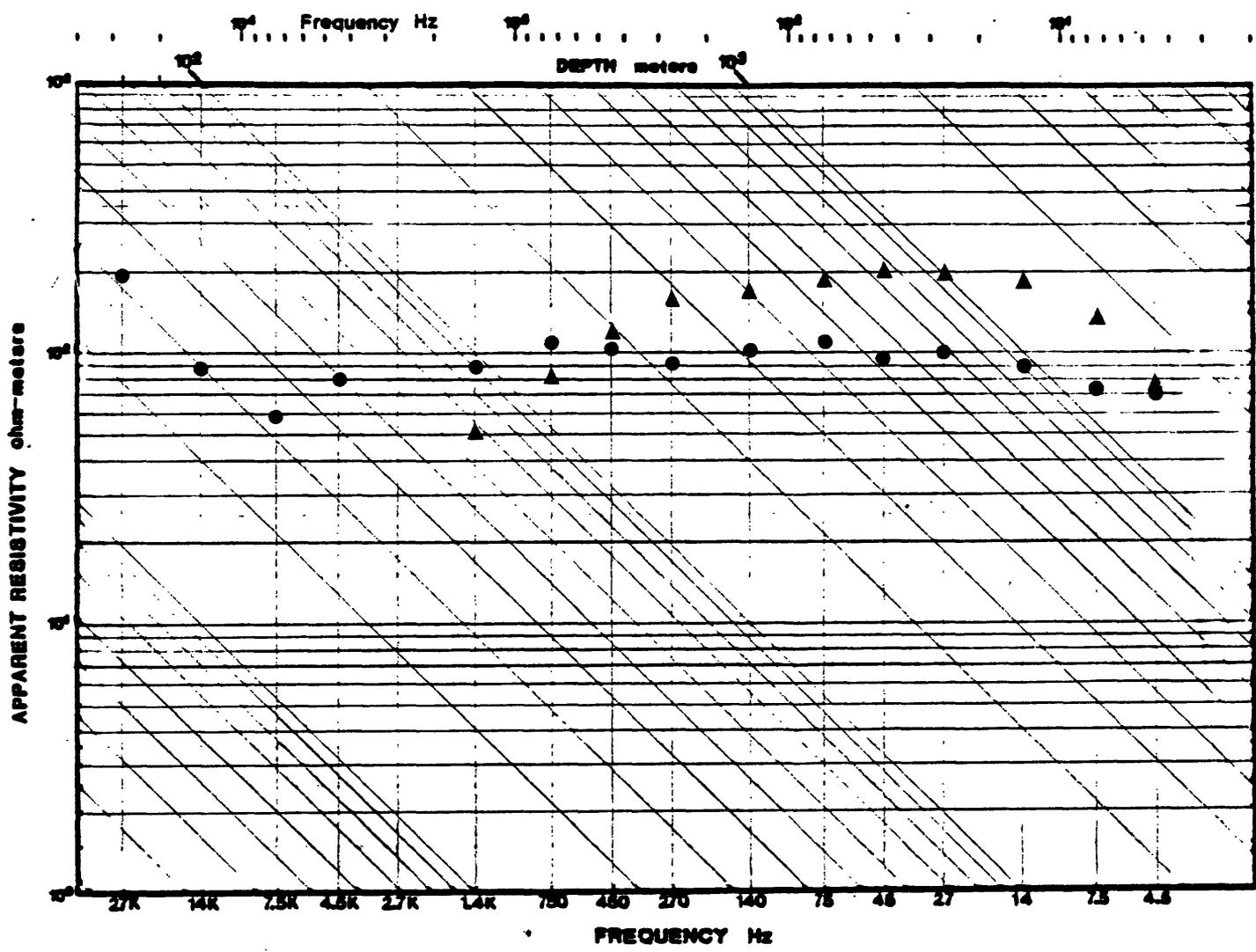
Location 10 Lakes, MT Station 35 Date 8-5-82 Operator DBH, MB



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Pa	Ma	Error	Pa	Ma	Error		
4.5	166	9	13.1	50.5	8	5.71		4.5
7.5	232	10	7.08	73.5	11	3.69		7.5
14	298	10	7.19	75.5	10	3.59		14
27	225	10	5.08	74.4	10	3.91		27
48	291	10	11.6	81.9	10	5.59		48
75	270	10	8.87	91.2	10	4.67		75
140	227	10	10.8	86.1	10	4.83		140
270	189	10	9.00	93.0	10	4.25		270
480	239	10	21.4	126	10	4.49		480
750	138	10	9.25	98.3	7	9.06		750
1.4K	198	2	9.86	192	6	10.5		1.4 K
2.7K	80.0	2	29.2	122	2	0.19		2.7 K
4.5K	116	10	9.13	92.1	10	3.97		4.5 K
7.5K	139	10	2.84	129	10	8.59		7.5 K
14K	105	5	2.61	102	5	3.81		14 K
27K	102	5	9.89	156	5	2.11		27 K

USGS Sealer AEMT Data Log

Location 10 Lakes, MT Station 36 Date 8-10-82 Operator DBH, MR



E-line orientation—N/S ●				E-line orientation—E/W ▲			Remarks	
Freq. Hz	Po	Ma	Error	Po	Ma	Error		Freq. Hz
4.5	69.0	10	7.49	76.8	10	5.74		4.5
7.5	71.4	10	3.12	137	8	7.93		7.5
14	89.8	10	3.67	187	8	11.8		14
27	99.2	10	1.81	199	10	14.2		27
45	94.9	10	2.90	201	9	10.3		45
75	109	10	2.77	187	10	8.58		75
140	101	10	4.03	161	10	10.2		140
270	92.4	10	3.37	154	8	6.68		270
450	104	8	4.58	118	8	10.8		450
750	110	7	4.15	81.6	10	5.94		750
1.4K	89.3	5	19.6	52.6	3	1.63		1.4K
2.7K	-	-	-	-	-	-		2.7K
4.5K	78.3	8	3.73	-	-	-		4.5K
7.5K	58.3	7	4.25	-	-	-		7.5K
14K	87.9	8	2.93	-	-	-		14K
27K	191	5	10.6	-	-	-		27K

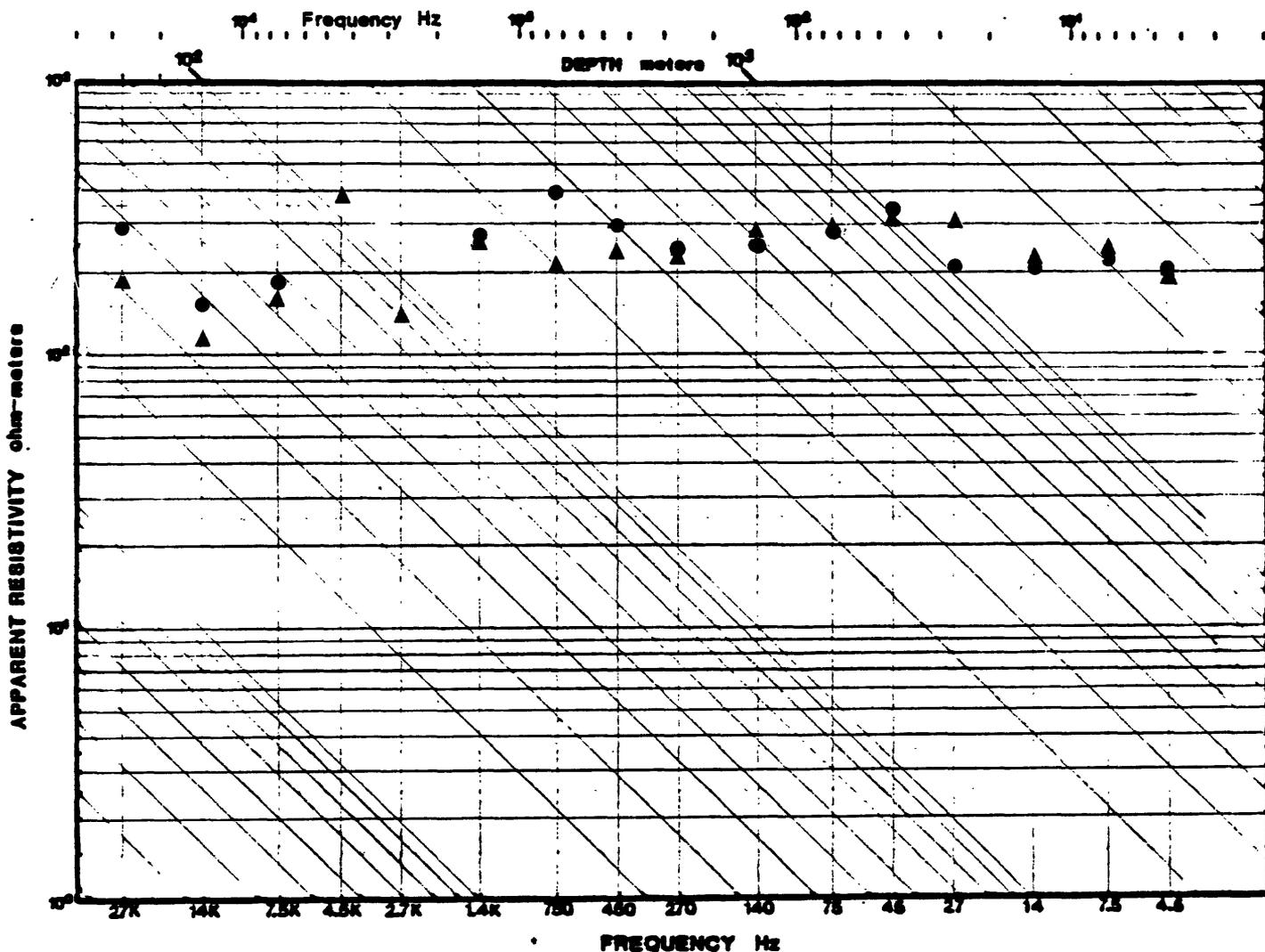
USGS Scler AMT Data Log

Location 10 Lakes, MT

Station 37

Date 8-10-82

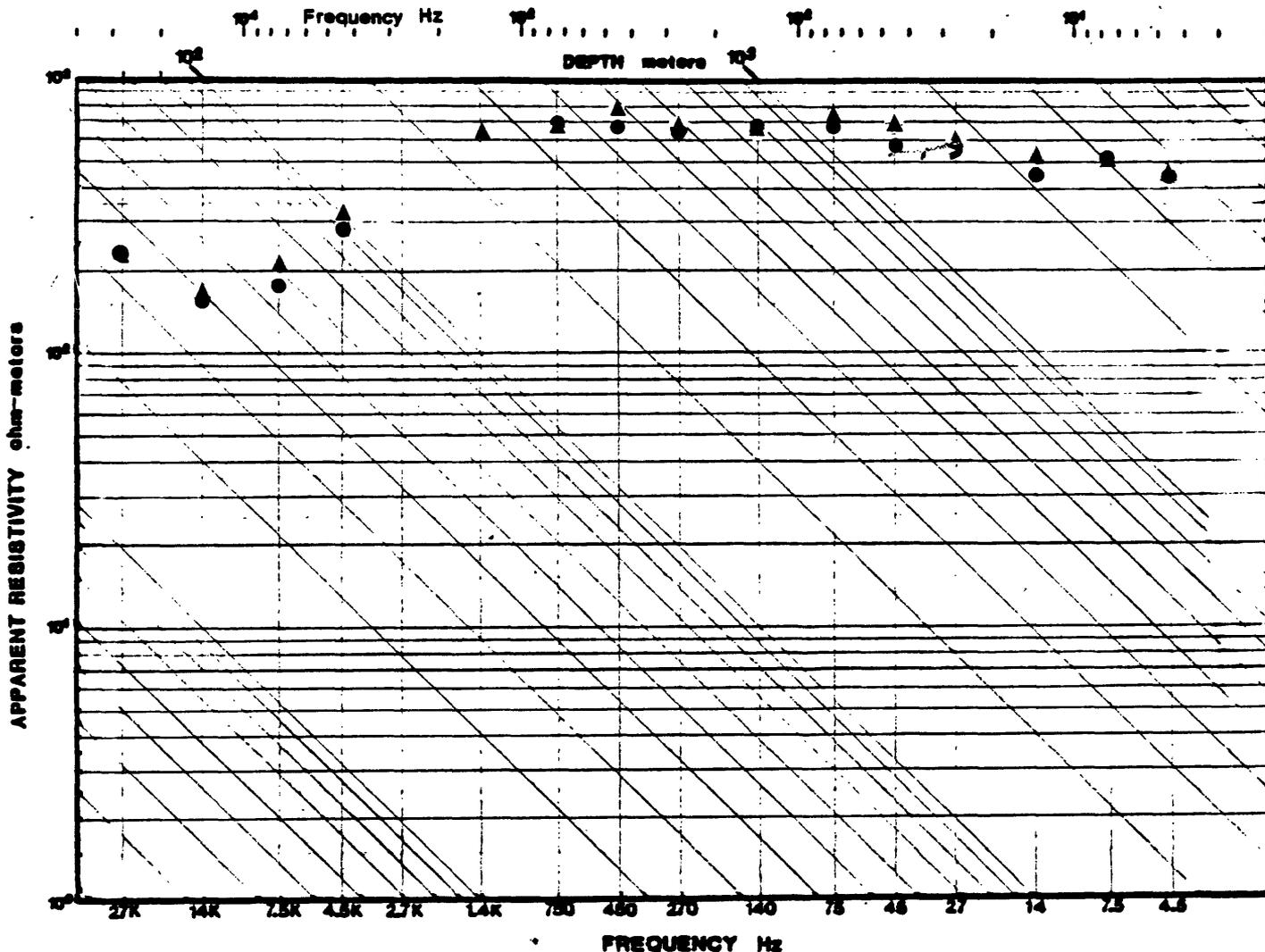
Operators DEH, MB



E-line orientation - N/S ●				E-line orientation - E/W ▲			Remarks	Freq. Hz
Freq. Hz	Po	Na	Error	Po	Na	Error		
4.5	203	8	30.3	194	9	15.3	4.5	
7.5	224	12	15.4	253	10	12.1	7.5	
14	204	10	19.0	225	10	8.12	14	
27	211	12	14.1	308	10	6.27	27	
45	217	10	9.88	311	10	14.1	45	
75	286	10	12.4	296	10	9.76	75	
140	256	10	10.5	281	10	13.2	140	
270	244	11	14.1	233	9	22.8	270	
450	295	9	15.0	239	10	25.4	450	
750	391	8	20.8	210	9	10.5	750	
1.4K	275	6	25.8	254	5	52.8	1.4 K	
2.7K	-	-	-	144	1	-	2.7 K	
4.5K	-	-	-	378	10	25.9	4.5 K	
7.5K	184	10	6.68	165	10	1.85	7.5K	
14K	153	5	6.36	119	5	7.48	14 K	
27K	290	5	12.1	191	3	2.45	27 K	

USGS Sealer AAT Data Log

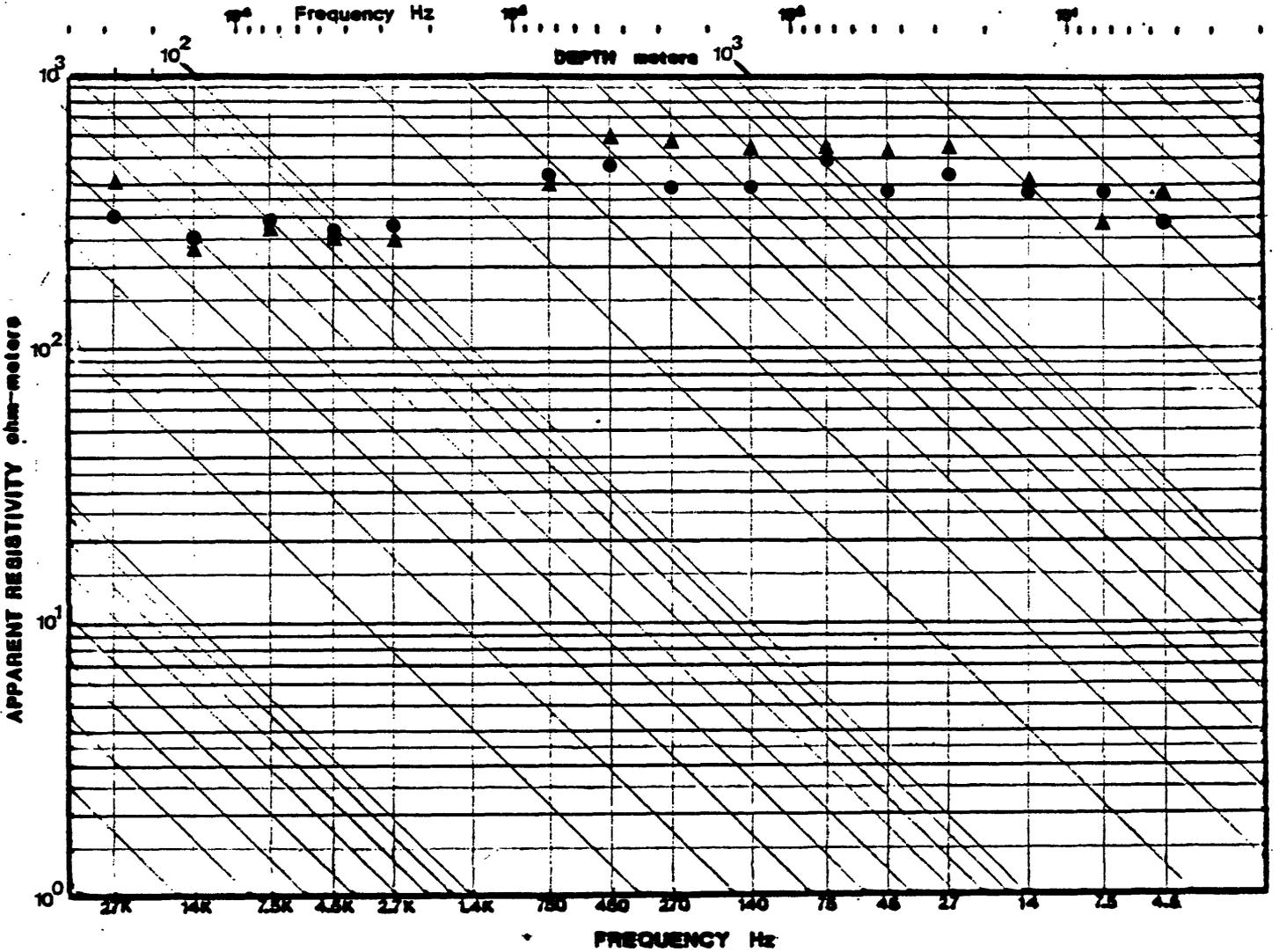
Location 10 Lakes, MT Station 38 Date 8-10-82 Operator DRH, MB



Freq. Hz	E-line orientation-- N/S ●			E-line orientation-- E/W ▲			Remarks	Freq. Hz
	P ₀	No.	Error	P ₀	No.	Error		
4.5	450	10	41.2	457	7	33.6		4.5
7.5	515	11	69.3	511	7	19.0		7.5
14	455	10	42.3	523	10	28.2		14
27	542	10	39.3	596	10	36.2		27
45	578	11	41.4	674	10	21.3		45
75	689	10	53.4	747	10	49.9		75
140	691	10	42.4	672	10	33.3		140
270	634	10	38.9	664	10	54.5		270
450	673	10	44.2	789	10	73.8		450
750	712	10	33.7	671	10	39.4		750
1.4K	-	-	-	644	2	15.5		1.4 K
2.7K	-	-	-	-	-	-		2.7 K
4.5K	285	10	89.5	332	10	18.5		4.5 K
7.5K	177	10	8.06	218	10	9.52		7.5 K
14K	157	6	10.7	163	5	1.88		14 K
27K	239	5	8.82	237	3	3.55		27 K

USGS Scaler AMT Data Log

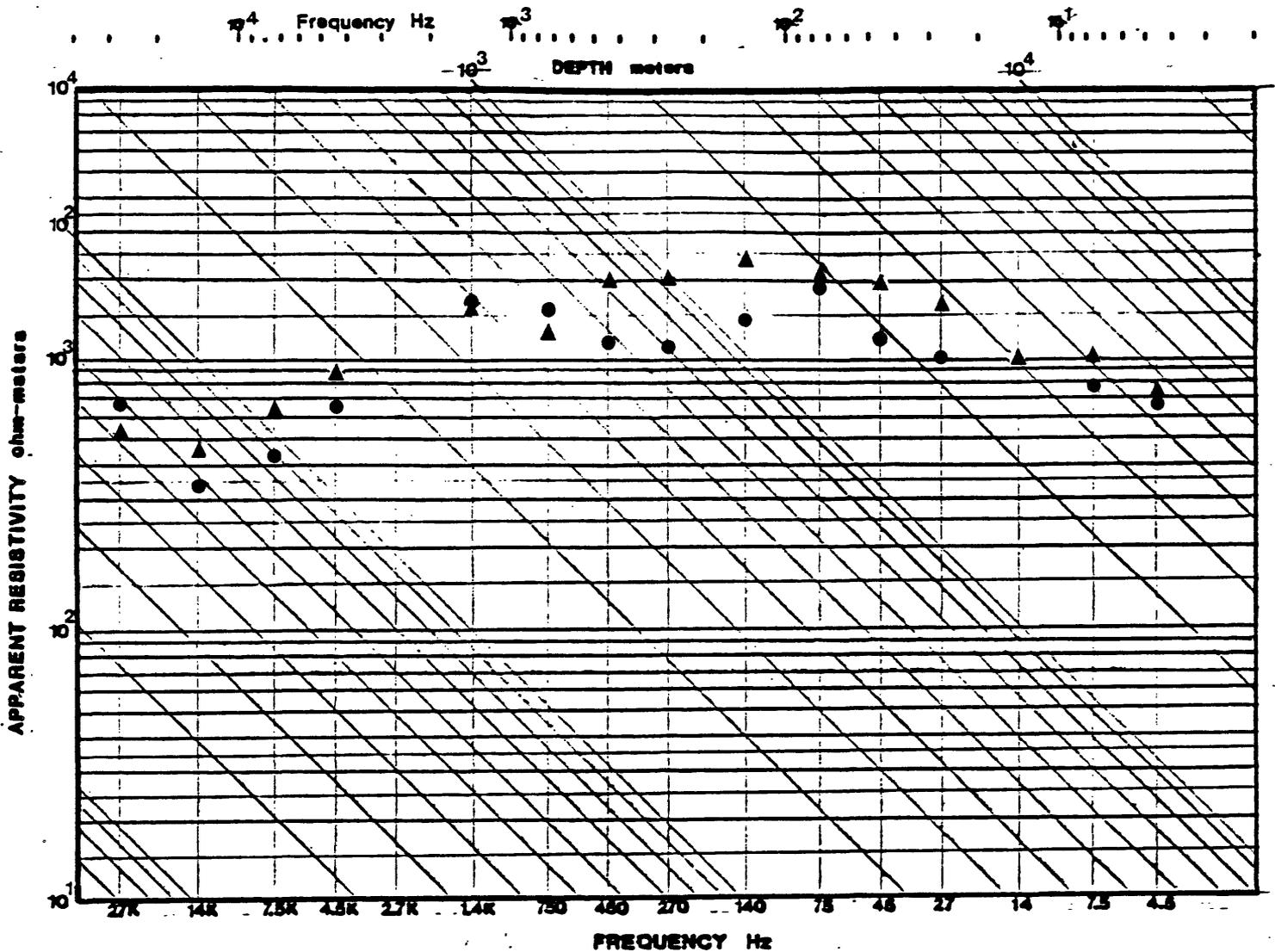
Location 10 Lakes MT Station 39 Date 8-10-82 Operator DEW MR



Freq. Hz	E-line orientation - N/S ●			E-line orientation - E/W ▲			Remarks	Freq. Hz
	Pa	Ma	Error	Pa	Ma	Error		
4.5	281	10	20.8	377	5	37.7		4.5
7.5	379	10	11.6	287	10	14.5		7.5
14	380	8	10.5	415	8	27.9		14
27	434	9	16.6	559	10	64.4		27
45	388	10	17.2	537	10	33.8		45
75	497	11	9.99	558	9	55.1		75
140	395	10	12.3	545	9	42.1		140
270	274	9	17.0	573	10	20.2		270
450	473	10	20.1	595	8	26.3		450
750	436	10	17.9	391	7	10.9		750
1.4K	-	-	-	-	-	-		1.4K
2.7K	286	6	23.3	244	10	16.9		2.7K
4.5K	261	10	13.3	257	10	12.9		4.5K
7.5K	293	10	37.5	269	9	5.47		7.5K
14K	258	5	20.8	233	5	9.96		14K
27K	303	5	6.75	404	5	6.01		27K

USGS Scaler A/T Data Log

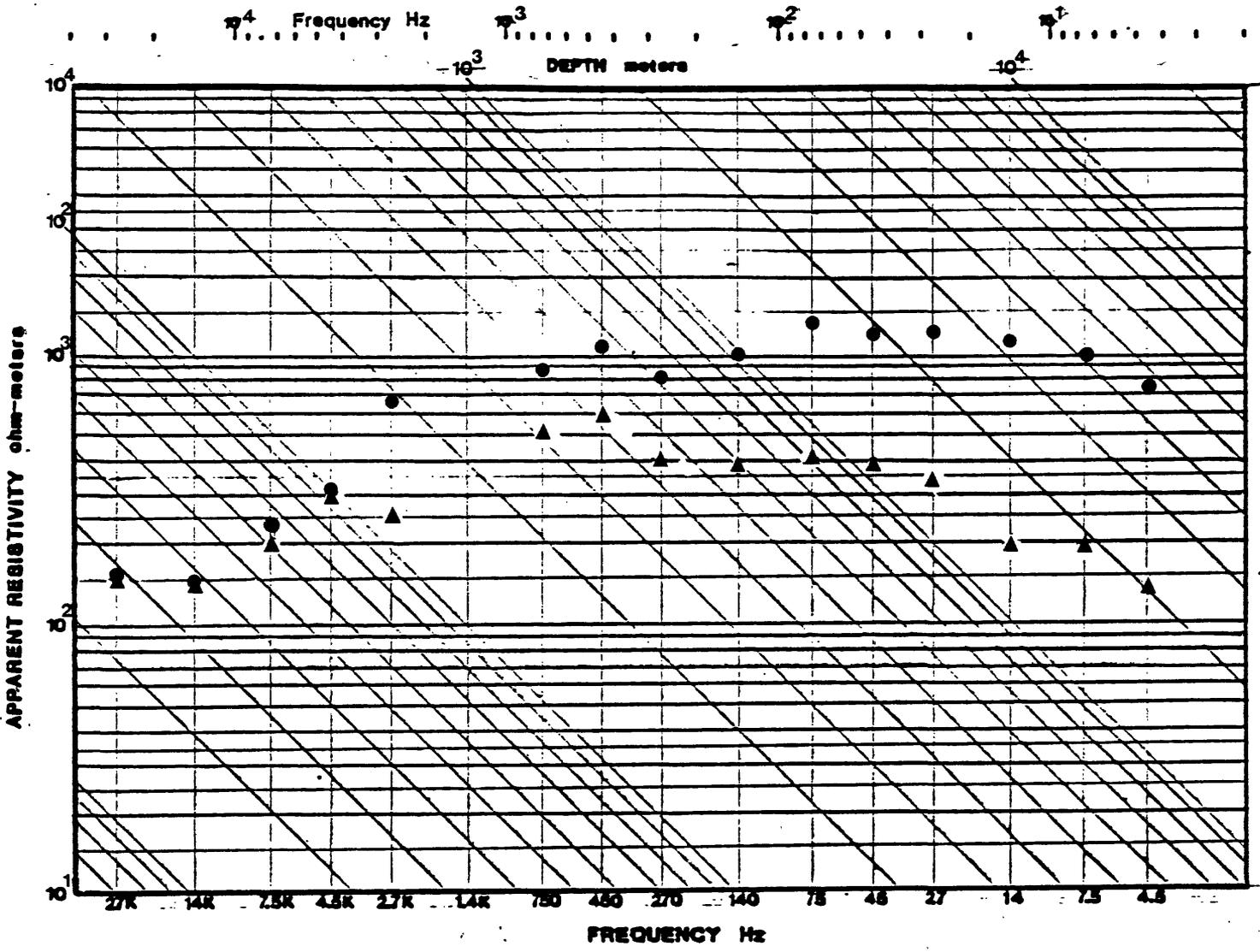
Location 10 Lakes, MT Station 40 Date 8-10-82 Operators DBH, MB



Freq. Hz	E-line orientation -- N/S ●			E-line orientation -- E/W ▲			Remarks	Freq. Hz
	Pa	Ma	Error	Pa	Ma	Error		
4.5	652	6	47.7	743	7	72.7		4.5
7.5	778	9	69.3	1047	10	69.7		7.5
14	1029	10	99.0	1028	10	33.2		14
27	1040	10	53.8	1663	10	66.8		27
48	1247	10	50.2	1958	10	126		48
75	1847	10	92.3	2182	10	80.0		75
140	1425	11	98.5	2359	10	77.2		140
270	1180	10	56.1	2049	10	82.9		270
450	1221	11	97.7	2010	10	38.0		450
750	1633	10	148	1293	10	16.4		750
1.4K	1750	8	79.5	1619	10	31.4		1.4K
2.7K	-	-	-	628	10	42.5		2.7K
4.5K	651	10	32.8	880	10	27.8		4.5K
7.5K	441	10	10.6	639	10	19.4		7.5K
14K	338	5	15.5	468	7	16.5		14K
27K	678	5	24.0	529	5	7.09		27K

USGS Sealer A&T Data Log

Location 10 Lakes, MT Station 41 Date 8-10-82 Operators DBH, ML



E-line orientation -- N/S ●				E-line orientation -- E/W ▲			Remarks	
Freq. Hz	P _a	N _a	Error	P _a	N _a	Error		
4.5	753	10	51.0				4.5	
7.5	491	10	39.6				7.5	
14	1209	10	76.8				14	
27	1249	10	40.1				27	
45	1226	10	38.2				45	
75	1391	9	42.3				75	
140	1016	9	47.7				140	
270	811	10	31.6				270	
450	1157	7	50.6				450	
750	872	10	44.6				750	
1.4K	-	-	-	-	-	-	1.4K	
2.7K	679	10	32.1				2.7K	
4.5K	316	10	26.8				4.5K	
7.5K	290	10	10.3				7.5K	
14K	195	5	5.04				14K	
27K	154	5	3.67				27K	